APPENDIX A CONNECTION ASSESSMENT

Engineering Connection Assessment

Strathcona Cogeneration Facility Connection

Inter Pipeline Propylene Ltd.
AESO Project Number: P1647

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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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Attachment A: Engineering Connection Assessment Results

1 Introduction

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

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

1.1 Project Overview

Inter Pipeline Propylene Ltd. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its approved Inter Pipeline Strathcona Cogeneration facility (the Facility) to the AIES. The facility will be served by the Market Participant's approved Central Utilities Block 672S substation.

The Market Participant's request includes a request for a Rate STS, *Supply Transmission Service*, contract capacity of 60 MW, a Rate DTS, *Demand Transmission Service*, contract capacity of 5 MW, and a request for transmission development (collectively, the Project). The Market Participant Rate STS is requested for October 1, 2020 however the Market Participant has indicated that it plans to request several increases to its Rate DTS. In total, these increases amount to a change in Rate DTS contract capacity of 60 MW. The Market Participant's final Rate DTS contract capacity increase request is planned for 2021 and would result in a final Rate DTS of 65 MW.

The scheduled in-service date (ISD) for the Project is March 1, 2020.

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 Transmission Facility Owner (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 Saskatchewan (Area 33), which is part of the AESO Northeast Planning Region.

From a transmission system perspective, Fort Saskatchewan consists primarily of a 138 kV and 240 kV transmission system. Fort Saskatchewan is connected to the AIES by several 500kV, 240kV and 138kV transmission lines to Edmonton (Area 60) and Cold Lake (Area 28). Additionally, Fort Saskatchewan is connected to the AIES via the East Alberta Transmission Line (EATL) High Voltage Direct Current (HVDC) line.

Existing constraints in the AESO's Northeast 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 Saskatchewan (Area 33), including the tie lines connecting this planning area to the rest of the AIES. All transmission facilities within the Study Area were 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 three (3) transmission alternatives to meet the Market Participant's request for system access service, as detailed in Section 3.2.

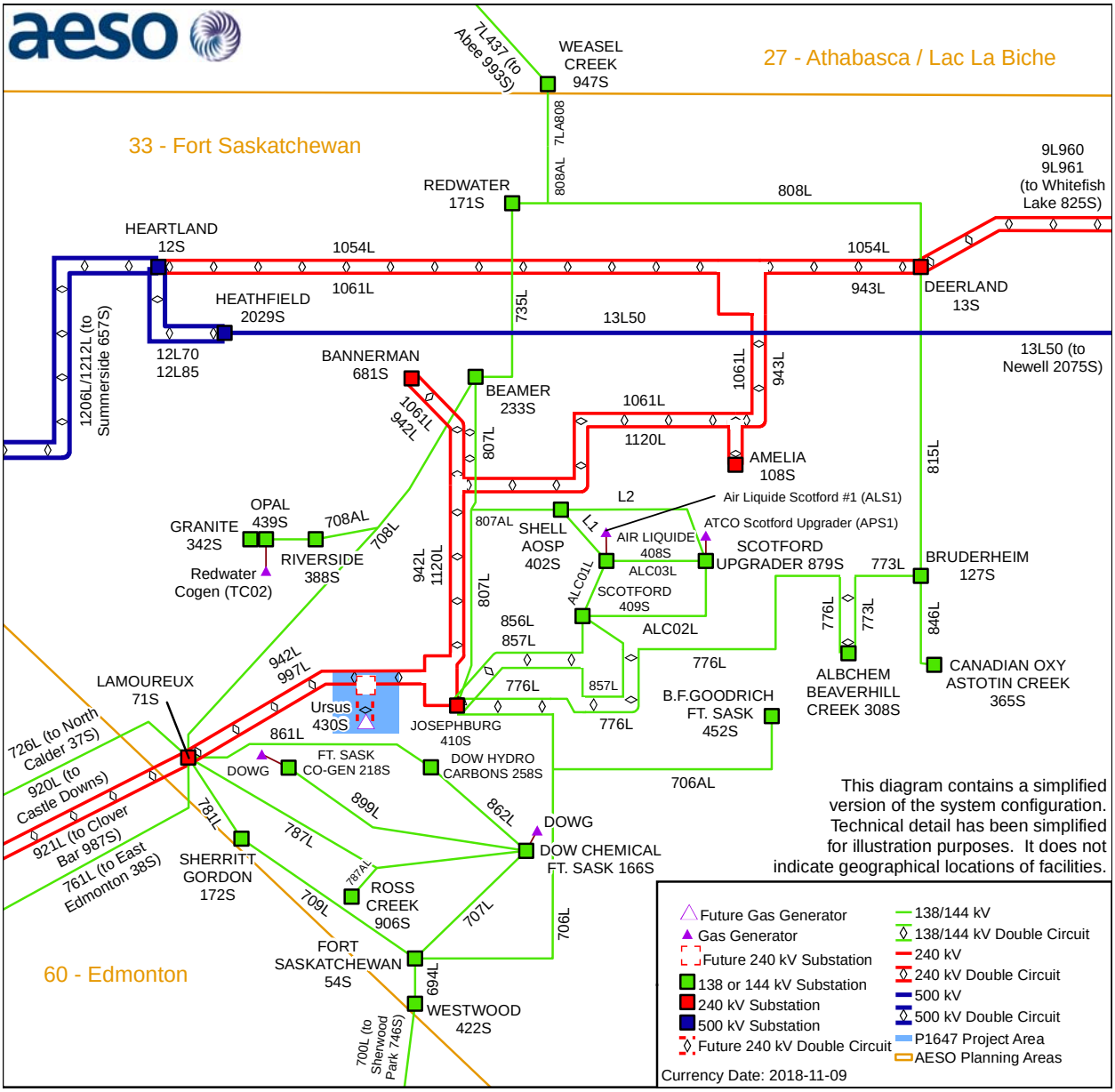
3.2 Connection Alternatives Examined

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

Alternative 1 – In-and-out connection to the 240kV transmission line 997L

This alternative includes the following developments:

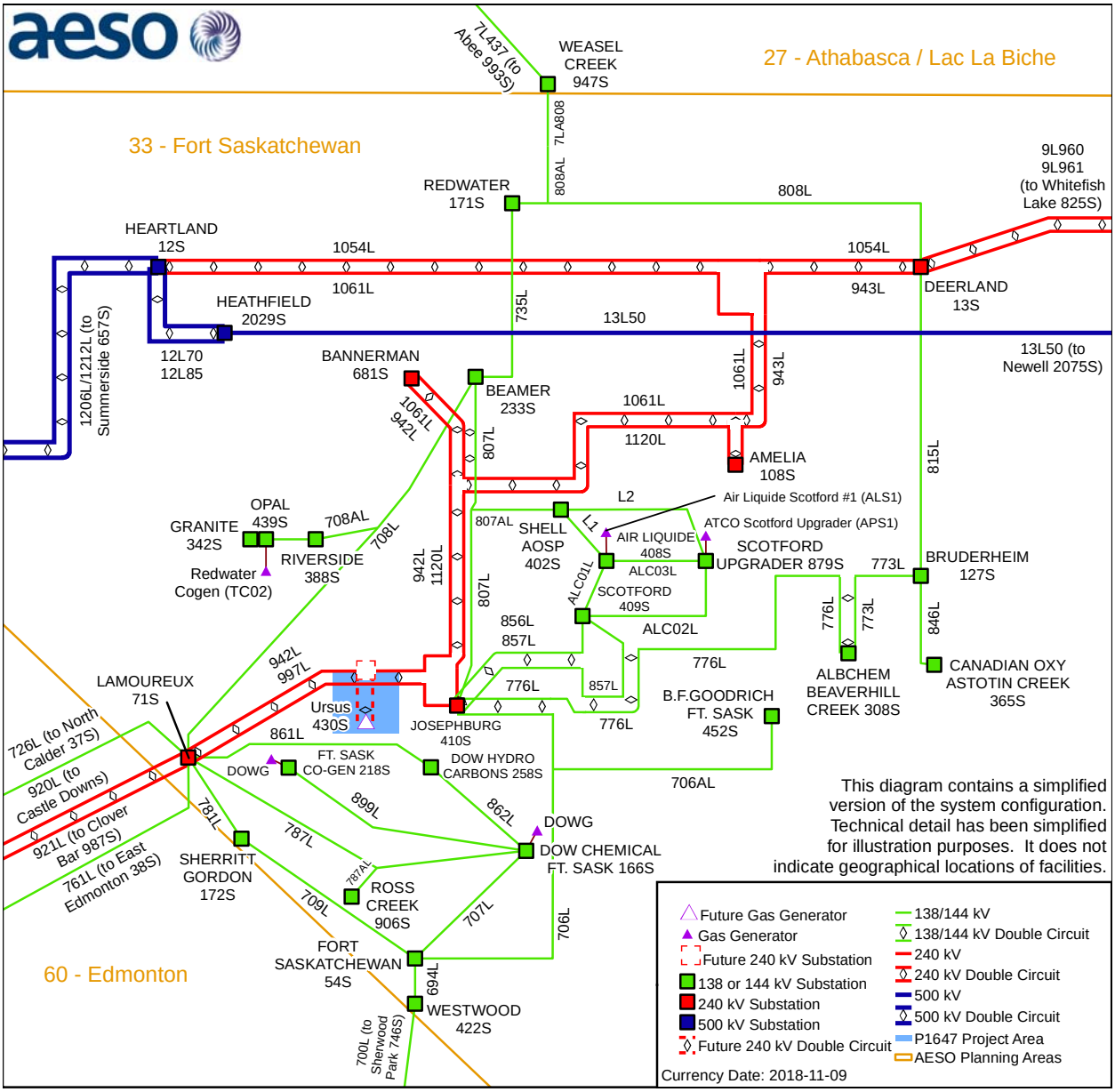
- Add one switching station, to be called Ursus 430S, including four 240 kV circuit breakers;
- Add two 240 kV circuits approximately 140 metres in length to connect the proposed Ursus 430S substation to the existing transmission line 997L in an in-and-out configuration;
- Connect the Central Utilities Block 672S substation to the Ursus 430S substation;and
- Add or modify associated equipment as required for the above developments.



Alternative 2 – In-and-out connection to the 240kV transmission line 942L

This alternative includes the following developments:

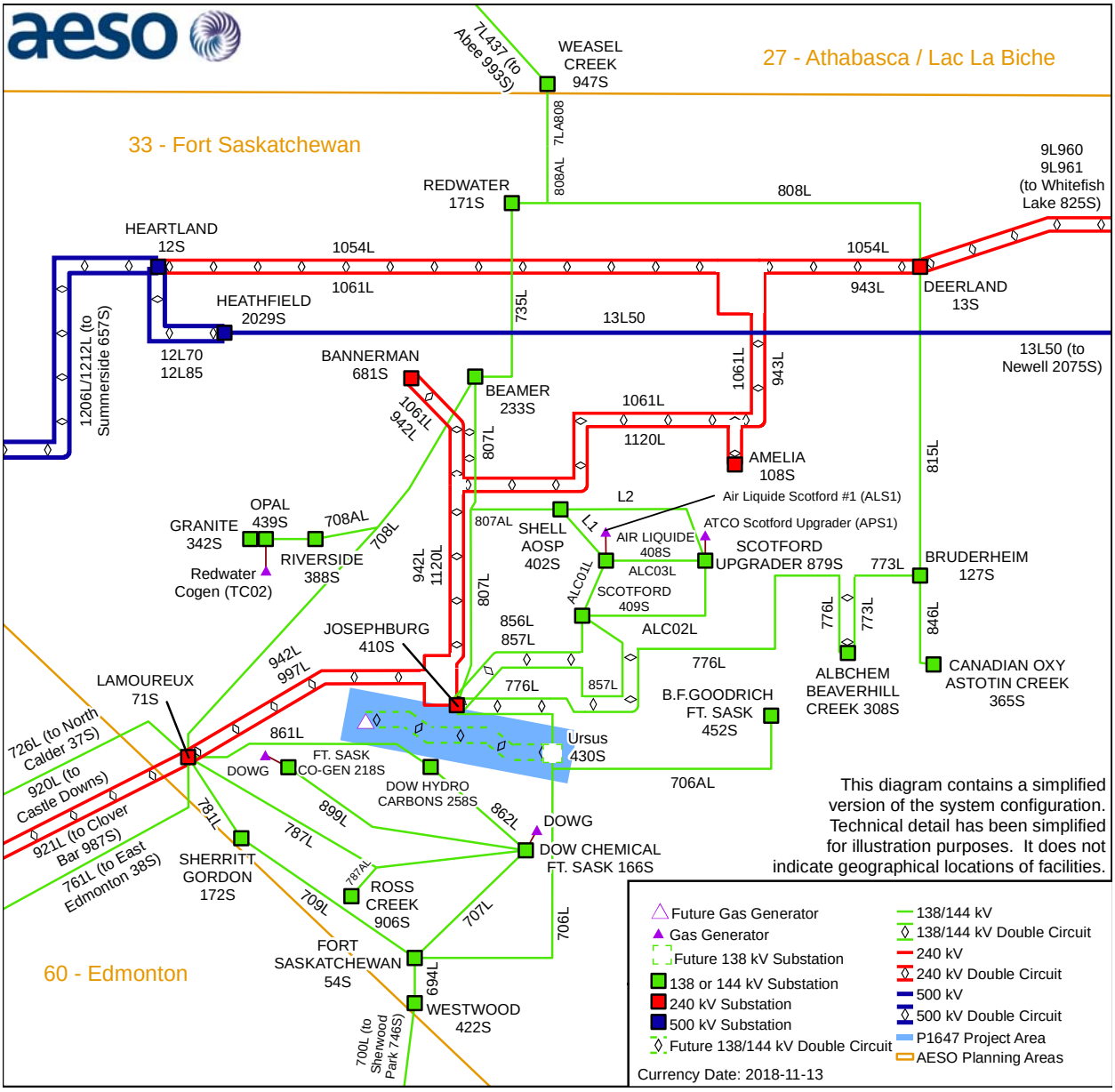
- Add one switching station, to be called Ursus 430S, including four 240 kV circuit breakers;
- Add two 240kV circuits approximately 130 to 150 metres in length to connect the proposed Ursus 430S substation to the existing transmission line 942L in an in-and-out configuration;
- Connect the Central Utilities Block 672S substation to the Ursus 430S substation;and
- Add or modify associated equipment as required for the above developments.



Alternative 3 – In-and-out connection to the 138kV transmission line 706L

This alternative includes the following developments:

- Add one switching station, to be called Ursus 430S, including four 138 kV circuit breakers;
- Add two 138kV circuits of approximately 3.5 km each in length to connect the proposed Ursus 430S substation to the existing transmission line 706L in an in-and-out configuration;
- Connect the Central Utilities Block 672S substation to Ursus 430S substation;and
- Add or modify associated equipment as required for the above developments.



3.3 Connection Alternatives Selected for Further Study

Alternative 1 was selected for further study.

3.4 Connection Alternatives Not Selected for Further Study

Alternatives 2 and 3 would involve increased transmission development compared to Alternative 1. Therefore, Alternatives 2 and 3 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

At the time of study, the scheduled ISD for the Project is March 1, 2020. Therefore, studies were performed using scenarios for 2020 SP, 2020 SL and 2020 WP.

Short-circuit studies were performed using the 2020 WP pre-Project, 2020 WP and 2028 WP post-Project scenarios.

As the studies were being completed, the Market Participant submitted a change proposal to stage the Rate DTS contract capacity, with the full 65 MW contract capacity being requested for July 2021. This change was assessed to have no material impact on the selected study scenarios.

Table 4-1 lists the study scenarios. Post-Project scenarios 4 and 5 reflect the requested Rate DTS capacity of 65 MW at the Market Participant's approved Ursus 430S substation.

Post project scenarios 6, 7, and 8 reflect the requested Rate STS contract capacity of 60 MW at the Market Particpant's approved facilty. Three sensitivity scenarios, 6a, 7a, and 8a are included to assess the potential impact of Heartland Generating Station Interconnection Project 1421 on the post-Project scenarios that reflect the requested Rate STS contract capacity of 60MW at the Market Particpant's approved facilty.

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	2020 SP	Economic	2020 SP Pre-Project	0	0
2	2020 SL	Economic	2020 SL Pre-Project	0	0
3	2020 WP	Economic	2020 WP Pre-Project	0	0
Post-Project					
4	2020 SP	Low Northeast Generation	2020 SP Post-Project DTS	65	0
5	2020 WP	Low Northeast Generation	2020 WP Post-Project DTS	65	0
6	2020 SP	Economic	2020 SP Post-Project STS	0	60

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
7	2020 SL	Economic	2020 SL Post-Project STS	0	60
8	2020 WP	Economic	2020 WP Post-Project STS	0	60
9	2028 WP	All study area generation in-service	2028 WP Post-Project STS	0	60
Post-Project Sensitivity Heartland Generating Station Interconnection (P1421)					
6a	2020 SP	Economic	2020 SP Post-Project STS (P1421)	0	60
7a	2020 SL	Economic	2020 SL Post-Project STS (P1421)	0	60
8a	2020 WP	Economic	2020 WP Post-Project STS (P1421)	0	60

The AESO Planning Region load used for the connection studies were based on the *AESO 2017 Long-term Outlook* (2017 LTO).

The AESO Planning Region generation dispatch used for scenarios 1, 2, 3, 6/6a, 7/7a, and 8/8a were based on the *AESO 2016 Long-term Outlook* (2016 LTO). Following the release of the 2017 LTO, a re-assessment was conducted on scenarios 1, 2, 3, 6/6a ,7/7a, and 8/8a using the 2017 LTO generation updates. The study results were not impacted with the use of the 2017 LTO generation updates, as the differences in the study area are minimal.

The AESO Planning Region generation dispatch used for scenarios 4 and 5 were based on the *AESO 2017 Long-term Outlook* (2017 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 point of delivery (POD) low voltage bus voltage deviations beyond the limits listed in Table 3-1 of Attachment A1.[1]

Power flow studies were performed for 2020 SP, 2020 SL and 2020 WP pre-Project and post-Project scenarios.

Pre-Project DTS scenario studies were not performed as the Post-Project DTS scenarios did not show any reliability criteria violations.

[1] 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.

4.2.2 Voltage Stability Studies

The purpose of the voltage stability studies is to determine the ability of the transmission system to maintain voltage stability at the busses in the Study Area.

Voltage stability studies were performed for 2020 WP for post-Project scenarios.

4.2.3 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 2020 SP, 2020 SL and 2020 WP post-Project scenarios.

4.2.4 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 2020 WP pre-Project scenario, the 2020 WP post-Project scenario, and the 2028 WP post-Project scenarios.

5 Results

5.1 Overview

This section provides an assessment of the impact of the Project on the performance of the AIES.

- 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 an overview of the post-Project Sensitivity Heartland Generating Station Interconnection Study Results.

Detailed study results are provided in Attachment A.

5.2 Pre-Project Study Results

5.2.1 Category A Conditions

No Reliability Criteria violations were observed under Category A conditions (i.e., all elements in service) for any of the pre-Project scenarios. The short-circuit fault levels were found to be within the typical capabilities of the nearby facilities.

5.2.2 Category B Conditions

No Reliability Criteria violations were observed under Category B conditions.

5.3 Post-Project Study Results

5.3.1 Category A Conditions

No Reliability Criteria violations were observed under Category A conditions for any Post-Project scenarios. 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

No Reliability Criteria violations or POD bus voltage deviations were observed under Category B conditions.

The voltage stability margin was met for all studied conditions.

5.4 Post-Project Sensitivity Heartland Generating Station Interconnection Study Results

5.4.1 Category A Conditions

No Reliability Criteria violations were observed under Category A conditions for any Post-Project scenarios. 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.

5.4.2 Category B Conditions

No Reliability Criteria violations or POD bus voltage deviations were observed under Category B conditions.

The voltage stability margin was met for all studied conditions.

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 and will not adversely affect the performance of the transmission system. The connection assessment did not identify any system performance issues in the pre-Project and post-Project scenarios studied.

Alternative 1 involves adding a switching station, to be designated Ursus 430S substation, including four 240 kV circuit breakers. This would require the addition of two 240 kV transmission lines approximately 140 metres in length to connect the Ursus 430S substation to the existing 240 kV transmission line 997L in an in-and-out configuration and connecting the Market Participant's approved Central Utilities Block 672S substation to the Ursus 430S substation.

The conductor used for the new 240 kV circuits should have a minimum thermal rating similar to the existing 240 kV transmission line 997L.

Attachment A:
Engineering Connection Assessment Results

Engineering Connection Assessment: Study Results

P1647 Strathcona Cogeneration Facility Connection

Inter Pipeline Propylene Ltd.

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Attachment A4 Post-Project Voltage Stability Diagrams
Attachment A5 Post-Project Transient Stability Diagrams
Attachment A6 Dynamic Data and Assumptions

1 Introduction

This report presents the results of the engineering studies that were completed by Stantec Consulting Ltd. 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, which was prepared by the AESO.

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

2 Pre-Project Study Results

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

2.1 Power Flow Studies

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

2.1.1 Scenario 1: 2020 Summer Peak Pre-Project

Category A Conditions

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

Category B Conditions

Thermal Criteria Violations

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

2.1.2 Scenario 2: 2020 Summer Light Pre-Project

Category A Conditions

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

Category B Conditions

Thermal Criteria Violations

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

2.1.3 Scenario 3: 2020 Winter Peak Pre-Project

Category A Conditions

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

Category B Conditions

Thermal Criteria Violations

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3 Post-Project Study Results

This section describes the results of the post-Project power flow studies, voltage stability 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 4: 2020 Summer Peak Post-Project DTS

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.2 Scenario 5: 2020 Winter Peak Post-Project DTS

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.3 Scenario 6: 2020 Summer Peak Post-Project STS

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.4 Scenario 7: 2020 Summer Light Post-Project STS

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.5 Scenario 8: 2020 Winter Peak Post-Project STS

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.6 Scenario 6a: 2020 Summer Peak Post-Project STS (P1421)

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.7 Scenario 7a: 2020 Summer Light Post-Project STS (P1421)

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.1.8 Scenario 8a: 2020 Winter Peak Post-Project STS (P1421)

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No thermal criteria violations were observed under Category B conditions.

Voltage Criteria Violations

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

3.2 Voltage Stability Studies

3.2.1 Scenario 5: 2020 Winter Peak Post Project DTS

Voltage stability analysis was performed for the 2020 Winter Peak post Project DTS scenario. The reference load level for the Study Area is 792 MW. For Category B contingencies, the minimum incremental load transfer is 5% of the reference load, or 39.6 MW (0.05 x 792 MW = 39.6 MW), in order to meet the voltage stability criteria.

Table 3-1 provides the voltage stability study results under the Category A condition and for the worst contingencies under Category B conditions. The voltage stability diagrams are provided in Attachment A4.

Table 3-1: Voltage Stability Study Results for Scenario 5: 2020 WP Post Project DTS

Contingency (System Element Lost)	From	To	Maximum Incremental Transfer (MW)	Meets Criteria?
N-0	System Normal		610	Yes
12S-T1	Heartland 12S 500kV/240kV		510	Yes
997L	Lamoureux 71S – Ursus 430S		540	Yes
1027L	Josephburg 410S – Ursus 430S		560	Yes
13S-T2	Deerland 13S 240kV/138kV		560	Yes
1054L	Heartland 12S – Deerland 13S		590	Yes

3.3 Transient Stability Studies

Transient stability studies were completed for Scenario 6 - 2020 Summer Peak, Scenario 7 – 2020 Summer Light and Scenario 8 – 2020 Winter Peak..

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 3-2, Table 3-3, and Table 3-4. The post-Project transient stability plots are provided in Attachment A5. The dynamic data and assumptions of all equipment proposed for the Facility are provided in Attachment A6.

Table 3-2: Transient Stability Study Results under Category B Conditions for Scenario 6

Studied Contingency	Fault Description and Location	Results
Line 997L (Lamoureux71S - Ursus430S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Ursus430S	Stable
Line 997L (Josephburg410S - Ursus430S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Ursus430S	Stable
Line 1120L (Josephburg410S - Amelia108S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Amelia108S	Stable
Line 943L (Deerland13S - Amelia108S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Amelia108S	Stable
Transformer 410S T1 (Josephburg410S - 240-138kV)	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 920L (Lamoureux71S - CastleDowns557S)	3P & LG fault at Lamoureux71S	Stable

	3P & LG fault at CastleDowns557S	Stable
Line 1054L (Deerland13S - Heartland12S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Heartland12S	Stable
Line 1061L (Bannerman681S - Heartland12S)	3P & LG fault at Bannerman681S	Stable
	3P & LG fault at Heartland12S	Stable
Line 942L (Lamoureux71S - Bannerman681S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Bannerman681S	Stable
Transformer 13S T2 (Deerland13S - 240-138kV)	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 776L (Josephburg410S - BeaverhillCk308S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at BeaverhillCk308S	Stable
Line 773L (Bruderheim127S - BeaverhillCk308S)	3P & LG fault at Bruderheim127S	Stable
	3P & LG fault at BeaverhillCk308S	Stable
Line 815L (Deerland13S - Bruderheim127S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Bruderheim127S	Stable
Line 735L (Redwater171S - Beamer233S)	3P & LG fault at Redwater171S	Stable
	3P & LG fault at Beamer233S	Stable
Line 808L (Deerland13S - Redwater171S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Redwater171S	Stable
Line 708L (Lamoureux71S - Beamer233S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Beamer233S	Stable
Line 807L (Josephburg410S - Beamer233S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Beamer233S	Stable

Table 3-3: Transient Stability Study Results under Category B Conditions for Scenario 7

Studied Contingency	Fault Description and Location	Results
Line 997L - Lamoureux71S - Ursus430S	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Ursus430S	Stable
Line 997L - Josephburg410S - Ursus430S	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Ursus430S	Stable
Line 1120L - Amelia108S - Josephburg410S	3P & LG fault at Amelia108S	Stable
	3P & LG fault at Josephburg410S	Stable

Line 943L - Deerland13S - Amelia108S	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Amelia108S	Stable
410S T1 - Josephburg410S - 240-138kV	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 920L - CastleDowns557S - Lamoureux71S	3P & LG fault at CastleDowns557S	Stable
	3P & LG fault at Lamoureux71S	Stable
Line 1054L - Deerland13S - Heartland12S	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Heartland12S	Stable
Line 1061L - Bannerman681S - Heartland12S	3P & LG fault at Bannerman681S	Stable
	3P & LG fault at Heartland12S	Stable
Line 942L - Bannerman681S - Lamoureux71S	3P & LG fault at Bannerman681S	Stable
	3P & LG fault at Lamoureux71S	Stable
Transformer 13S T2 - Deerland13S - 240-138kV	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 776L - BeaverhillCk308S - Josephburg410S	3P & LG fault at BeaverhillCk308S	Stable
	3P & LG fault at Josephburg410S	Stable
Line 773L - Bruderheim127S - BeaverhillCk308S	3P & LG fault at Bruderheim127S	Stable
	3P & LG fault at BeaverhillCk308S	Stable
Line 815L - Deerland13S - Bruderheim127S	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Bruderheim127S	Stable
Line 735L - Redwater171S - Beamer233S	3P & LG fault at Redwater171S	Stable
	3P & LG fault at Beamer233S	Stable
Line 808L - Redwater171S - Deerland13S	3P & LG fault at Redwater171S	Stable
	3P & LG fault at Deerland13S	Stable
Line 708L - Beamer233S - Lamoureux71S	3P & LG fault at Beamer233S	Stable
	3P & LG fault at Lamoureux71S	Stable
Line 807L - Beamer233S - Josephburg410S	3P & LG fault at Beamer233S	Stable
	3P & LG fault at Josephburg410S	Stable

Table 3-4: Transient Stability Study Results under Category B Conditions for Scenario 8

Studied Contingency	Fault Description and Location	Results
Line 997L (Lamoureux71S - Ursus430S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Ursus430S	Stable
Line 997L (Josephburg410S - Ursus430S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Ursus430S	Stable
Line 1120L (Josephburg410S - Amelia108S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Amelia108S	Stable
Line 943L (Deerland13S - Amelia108S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Amelia108S	Stable
Transformer 410S T1 (Josephburg410S - 240-138kV)	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 920L (Lamoureux71S - CastleDowns557S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at CastleDowns557S	Stable
Line 1054L (Deerland13S - Heartland12S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Heartland12S	Stable
Line 1061L (Bannerman681S - Heartland12S)	3P & LG fault at Bannerman681S	Stable
	3P & LG fault at Heartland12S	Stable
Line 942L (Lamoureux71S - Bannerman681S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Bannerman681S	Stable
Transformer 13S T2 (Deerland13S - 240-138kV)	3P & LG fault at (240kV)	Stable
	3P & LG fault at (138kV)	Stable
Line 776L (Josephburg410S - BeaverhillCk308S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at BeaverhillCk308S	Stable
Line 773L (Bruderheim127S - BeaverhillCk308S)	3P & LG fault at Bruderheim127S	Stable
	3P & LG fault at BeaverhillCk308S	Stable
Line 815L (Deerland13S - Bruderheim127S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Bruderheim127S	Stable
Line 735L (Redwater171S - Beamer233S)	3P & LG fault at Redwater171S	Stable
	3P & LG fault at Beamer233S	Stable
Line 808L (Deerland13S - Redwater171S)	3P & LG fault at Deerland13S	Stable
	3P & LG fault at Redwater171S	Stable
Line 708L (Lamoureux71S - Beamer233S)	3P & LG fault at Lamoureux71S	Stable
	3P & LG fault at Beamer233S	Stable

Line 807L (Josephburg410S - Beamer233S)	3P & LG fault at Josephburg410S	Stable
	3P & LG fault at Beamer233S	Stable

4 Short Circuit Studies

4.1 Pre-Project Results

Pre-Project short-circuit current levels are provided in Table 4-1[1] for Scenario 3 (2020 WP pre-Project). These results include P1421.

Table 4-1: Pre-Project Short-Circuit Current Levels for Scenario 3

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)
Scotford 409S	138.0	140.63	28.099	0.002602+j0.015005	25.901	0.002243+j0.019034
Riverside 388S	138.0	140.66	18.639	0.004920+j0.022404	14.705	0.007306+j0.040786
Lamoureux 71S	240.0	248.03	22.725	0.001898+j0.010869	19.159	0.002795+j0.017016
Fort Saskatchewan 54S	138.0	141.82	25.699	0.004152+j0.016253	21.439	0.005207+j0.026370
Beamer 233S	138.0	140.47	21.931	0.004090+j0.019044	17.229	0.006620+j0.034782
Sherrit Gordon 172S	138.0	142.03	25.321	0.004015+j0.016571	20.826	0.005287+j0.027690
Lamoureux 71S	138.0	142.65	29.989	0.002803+j0.014189	27.273	0.002729+j0.018689
Deerland 13S	138.0	141.64	17.142	0.003624+j0.024893	17.739	0.001476+j0.022770
Deerland 13S	240.0	250.68	16.047	0.002054+j0.015674	13.815	0.002741+j0.023374
Josephburg 410S	240.0	248.01	20.719	0.001757+j0.011960	19.175	0.001860+j0.014901
Josephburg 410S	138.0	140.82	29.647	0.002476+j0.014243	27.702	0.002012+j0.017440
Albchem Beaverhill Creek 308S	138.0	141.18	13.066	0.006649+j0.032208	9.578	0.013857+j0.067471
Dow Hydro Carbons 258S	138.0	142.38	22.489	0.004100+j0.018801	18.846	0.005635+j0.029992
Shell AOSP1 402S	138.0	140.53	26.899	0.002806+j0.015645	24.018	0.002986+j0.021446

[1] 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.

Ursus 430S	240.0					

4.2 Post-Project Results

4.2.1 Scenario 8: 2020 WP Post-Project STS

Post-Project short-circuit current levels for Scenario 8 are provided in Table 4-2. These results include P1421.

Table 4-2: Post-Project Short-Circuit Current Levels for Scenario 8

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)
Scotford 409S	138.0	140.28	28.624	0.002525+j0.014763	26.589	0.002099+j0.018356
Riverside 388S	138.0	140.34	18.841	0.004854+j0.022201	14.857	0.007263+j0.040446
Lamoureux 71S	240.0	247.28	23.320	0.001825+j0.010601	19.799	0.002695+j0.016329
Fort Saskatchewan 54S	138.0	141.49	26.045	0.004085+j0.016059	21.744	0.005144+j0.026002
Beamer 233S	138.0	140.14	22.220	0.004021+j0.018831	17.465	0.006550+j0.034346
Sherrit Gordon 172S	138.0	141.69	25.658	0.003948+j0.016376	21.121	0.005217+j0.027302
Lamoureux 71S	138.0	142.31	30.458	0.002736+j0.013991	27.796	0.002646+j0.018263
Deerland 13S	138.0	141.28	17.278	0.003582+j0.024728	17.878	0.001464+j0.022624
Deerland 13S	240.0	249.93	16.304	0.001992+j0.015438	14.058	0.002687+j0.022935
Josephburg 410S	240.0	246.94	21.528	0.001660+j0.011528	20.469	0.001555+j0.013378
Josephburg 410S	138.0	140.46	30.255	0.002395+j0.013988	28.622	0.001798+j0.016583
Albchem Beaverhill Creek 308S	138.0	140.82	13.164	0.006593+j0.032016	9.642	0.013801+j0.067168
Dow Hydro Carbons 258S	138.0	142.05	22.750	0.004037+j0.018610	19.062	0.005598+j0.029686
Shell AOSP1 402S	138.0	140.19	27.366	0.002732+j0.015410	24.557	0.002879+j0.020866
Ursus 430S	240.0	246.96	21.441	0.001684+j0.011569	20.042	0.001798+j0.014043

4.2.2 Scenario 9: 2028 WP Post-Project STS

Post-Project short-circuit current levels for Scenario 9 are provided in Table 4-4. These results include P1421.

Table 4-3: Post-Project Short-Circuit Current Levels for Scenario 9

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)
Scotford 409S	138.0	140.49	29.136	0.002388+j0.014216	27.110	0.002090+j0.017593
Riverside 388S	138.0	140.85	19.645	0.004499+j0.020932	16.299	0.005791+j0.034281
Lamoureux 71S	240.0	247.26	24.042	0.001633+j0.010057	20.242	0.002680+j0.015743
Fort Saskatchewan 54S	138.0	141.73	26.397	0.003906+j0.015520	21.875	0.005128+j0.025520
Beamer 233S	138.0	140.50	22.842	0.003961+j0.017945	18.025	0.006326+j0.032528
Sherrit Gordon 172S	138.0	141.93	25.991	0.003765+j0.015835	21.242	0.005194+j0.026789
Lamoureux 71S	138.0	142.57	31.064	0.002542+j0.013442	28.247	0.002608+j0.017682
Deerland 13S	138.0	141.55	17.299	0.003452+j0.024219	17.899	0.001397+j0.022152
Deerland 13S	240.0	251.09	16.976	0.001722+j0.014522	14.807	0.002370+j0.020965
Josephburg 410S	240.0	247.51	22.297	0.001471+j0.010890	21.464	0.001555+j0.012158
Josephburg 410S	138.0	140.67	30.867	0.002247+j0.013436	29.331	0.001771+j0.015729
Albchem Beaverhill Creek 308S	138.0	141.00	13.116	0.006464+j0.031475	9.560	0.013760+j0.066656
Dow Hydro Carbons 258S	138.0	142.32	22.940	0.003853+j0.018085	19.089	0.005598+j0.029265
Shell AOSP1 402S	138.0	140.43	27.850	0.002605+j0.014847	25.030	0.002848+j0.020031
Ursus 430S	240.0	247.42	22.138	0.001498+j0.010962	20.854	0.001811+j0.012979

Attachment A1
Engineering Connection Assessment: Study Scope

Study Scope

P1647 Strathcona Cogeneration Facility Connection

Inter Pipeline Propylene Ltd.

Date: November 5, 2018
Version: V4
Classification: Public

Company Name	Name and Credentials	Date	Signature
Stantec Consulting Ltd.	Sanjay Upadhyay, P.Eng	Nov 9. 2018	
AESO	Myron Jin-Li, E.I.T. Marylyn Ilagan, P. Eng	Nov. 9, 2018 Nov. 13, 2018	
Market Participant	Cody Loos, P. Eng	Nov 9, 2018	

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Attachments

Attachment A: Transmission Planning Criteria – Basis and Assumptions

1 Introduction

This Study Scope provides an overview of the engineering studies to be completed by Stantec Consulting Ltd. (the Studies Consultant) to assess the impact of the Project 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

Inter Pipeline Propylene Ltd. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its approved Strathcona Cogeneration Facility (Facility) to the AIES.

The Market Participant's request includes a request for a Rate STS, *Supply Transmission Service*, contract capacity of 60 MW and a Rate DTS, *Demand Transmission Service*, contract capacity of 5 MW, and a request for transmission development (collectively, the Project). The Market Participant Rate STS is requested for October 1, 2020 however the Market Participant has indicated that it plans to request several increases to its Rate DTS. In total, these increases amount to an increase in Rate DTS contract capacity of 60 MW. The Market Participant's final Rate DTS contract capacity increase request is planned for 2021 and would result in a final Rate DTS of 65 MW.

The scheduled in-service date (ISD) for the Project is March 1, 2020

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	65 MW
	Type	Oilsands
	Motors (number and size)	Not Applicable
	Power factor	0.9 power factor (pf) lagging
	Future load expansion plans	No
Generation	Generation type	Cogeneration
	Existing Rate STS, *Supply Transmission Service,* contract capacity	0 MW
	Requested Rate STS	60 MW
	Number and size of generating units	2 Siemens Sigentics S-Modyn 1DS-2072-8AN02-Z units
	Maximum authorized real power (MARP)	116 MW at -40 degrees Celsius
	Maximum capability (MC)	103 MW at +2.9 degrees Celsius

Project Component		Description
	Reactive power capability	34 MVAr (0.95 pf absorbing)
		50 MVAr (0.9 pf reducing)
	Future generation expansion plans	No

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 Saskatchewan (Area 33).

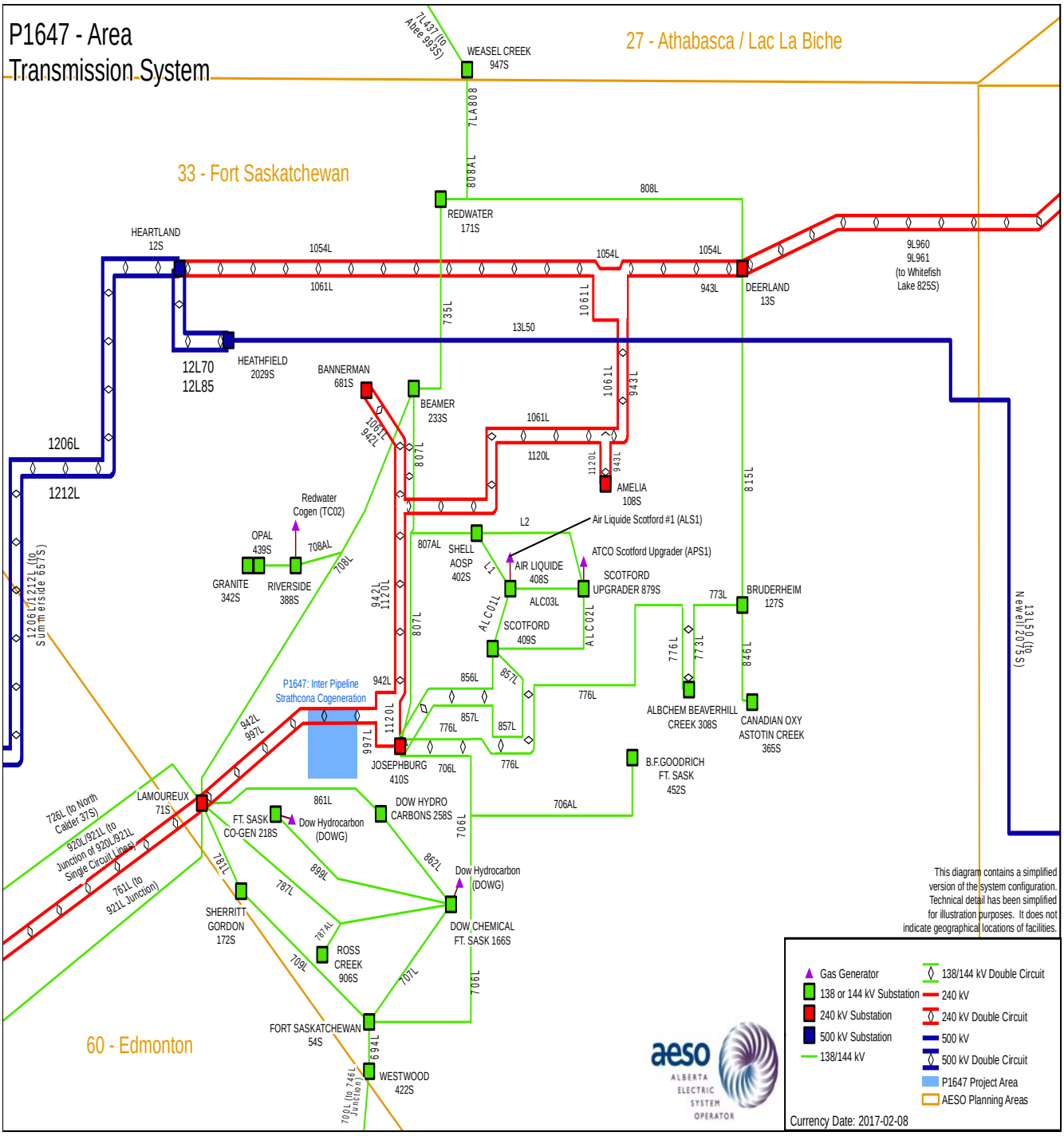
The Study Area consists of the AESO planning area(s) of Fort Saskatchewan (Area 33) including the tie lines connecting this planning area to the rest of the AIES.

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

1.2.2 Existing Constraints

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

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



2 Connection Alternative to be Studied

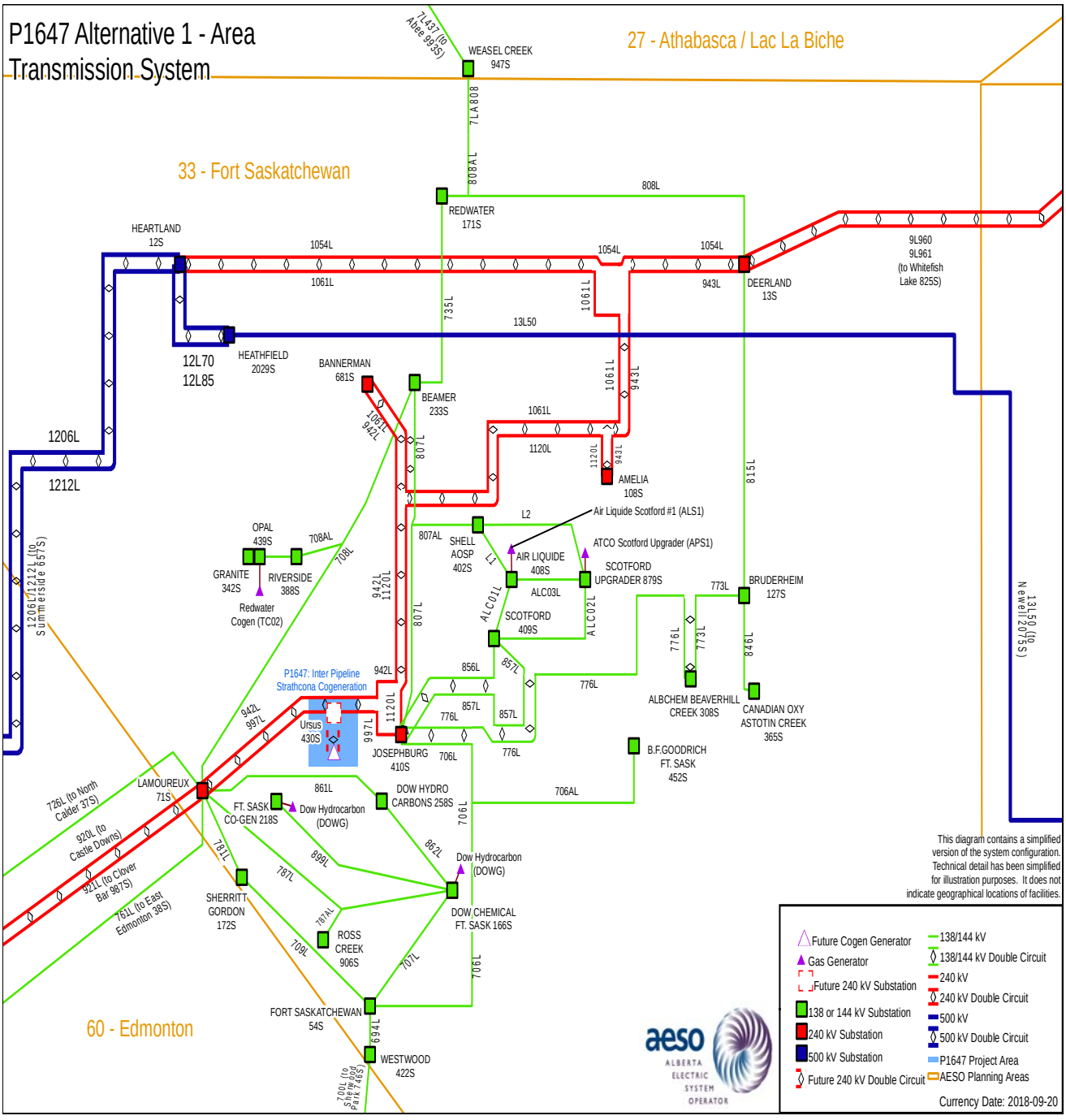
2.1 Alternative 1 – In-and-out connection to the 240 kV transmission line 997L

This alternative included the following developments:

- Add one switching station, to be called Ursus 430S, including four 240 kV circuit breakers;
- Add two 240 kV circuits approximately 140 metres in length to connect the proposed Ursus 430S substation to the existing transmission line 997L in an in-and-out configuration;
- Connect the Central Utilities Block 672S substation to Ursus 430S substation;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 and 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.*
- 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 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 AESO's *Connection Study Requirements*, the AESO's *Generation and Load Interconnection Standard*, and Sections 502.5 and 502.6 of the ISO rules as they relate to *Generating Unit Technical and 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.

4.1.1.1 Sensitivity Scenario - P1421 Heartland Assumed In Service

Three sensitivity scenarios, 6a, 7a, and 8a are included to assess the potential impact of Heartland Generating Station Interconnection Project 1421 on the post-Project scenarios.

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	2020 SP	Economic	2020 SP Pre-Project	0	0
2	2020 SL	Economic	2020 SL Pre-Project	0	0
3	2020 WP	Economic	2020 WP Pre-Project	0	0
Post-Project					
4	2020 SP	Low Northeast Generation	2020 SP Post-Project DTS	65	0 (Offline)
5	2020 WP	Low Northeast Generation	2020 WP Post-Project DTS	65	0 (Offline)
6	2020 SP	Economic	2020 SP Post-Project STS	0	60
7	2020 SL	Economic	2020 SL Post-Project STS	0	60
8	2020 WP	Economic	2020 WP Post-Project STS	0	60
9	2028 WP	All study area generation in-service	2028 WP Post-Project STS	0	60
Post-Project Sensitivity Heartland Generating Station Interconnection (P1421)					
6a	2020 SP	Economic	2020 SP Post-Project STS (P1421)	0	60
7a	2020 SL	Economic	2020 SL Post-Project STS (P1421)	0	60
8a	2020 WP	Economic	2020 WP Post-Project STS (P1421)	0	60

4.2 Assumptions

4.2.1 System Project Assumptions

Table 4-2 summarizes the connection projects in the AESO Connection Queue that will be included in the studies.

Table 4-2: Planned System Transmission Projects to be Included in the Studies

AESO Project No.	Project Name/Description	Scheduled ISD	AUC NID Decision No.	AUC NID Decision Date
850	South and West Edmonton Area Transmission System Reinforcement	Q1 2018	U2014-183	May 5, 2014
1381	807L Capacity Increase*	Q4 2019	22040-D02-2017	January 23, 2017
1186	Thickwood Hills 240 kV Transmission Development and Reactive Power Reinforcement	Q4-2018	3588-D02-2015	March 12, 2015
1590	Fort McMurray West 500 kV Transmission Project	Q2 2019	21030-D02-2017**	February 10, 2017
1655	Sunnybrook and Livock Interconnection with Fort McMurray West 500kV Transmission Facilities	Q4 2018	20736-D02-2015	November 19, 2015

*This system project is to be assumed in-service for the sensitivity cases which include Project 1421, due to the milestone requirement

**Decision 21030-D02-2017 issued on February 10, 2017 provides approval for the facilities application submitted by Alberta PowerLine General Partner Ltd. A Needs Identification Document (NID) application was not required because the Project is considered Critical Transmission Infrastructure.

4.2.2 Connection Project Assumptions

Table 4-3 summarizes the connection projects in the AESO Connection Queue that will be included in the studies.

Table 4-3: Planned Connection Projects Included in the Studies

AESO Project Number	AESO Project Name	AESO Planning Area	Generation (MW)	Load (MW)	Scheduled ISD
1258	Fortis Alberta Grist Lake (Pike) Substation	25	0.0	23.2	July 1, 2020
1289	Maxim Power Deerland Peaking Station	33	185.8	0.0	December 1, 2020
1404	Cenovus Narrows Lake Substation (Boreal)	25	0.0	35.0	September 30, 2020
1421	ATCO Power Heartland Generating Station	33	510.0	15.0	November 1, 2019

Notes:

Per the AESO Connection Queue posted in October 2018.

4.2.3 Load Assumptions

The load forecast to be used for the studies is shown in Table 4-4 and is taken from a project specific forecast based on the *AESO's 2017 Long-term Outlook* (2017 LTO)[1] at the AESO Northeast Planning Region peak. For the studies, when loads for the Alberta Internal Load (AIL) are modified to align with the load forecast in the 2017 LTO, the active power to reactive power ratio in the base case scenarios will be maintained.

Table 4-4: Forecast Area Peak Load (2017 LTO at AESO Northeast Planning Region Peak)

AESO Planning Area or Region Name	Forecast Peak Load by Year/Season (MW)		
	2020 SL	2020 SP	2020 WP
Northeast Planning Region*	2,203	2,870	3,233

Note:
* The Northeast Region comprises the following AESO planning areas: 25, 27, 33

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

4.2.4 Generation Assumptions

Non-renewable generation dispatch conditions for selected generating units in the Study Area are described in Table 4-5. Additional studies may be required in the event of changes to the AESO's corporate forecast.

Scenarios 1, 2, 3, 6/6a, 7/7a, 8/8a

The generation forecast to be used for the studies is based on the *AESO's 2016 Long-term Outlook* (2016 LTO).[2] The generation assumptions for the studies will assume that the Sundance units 1 and 2 are retired.[3] Following the release of the 2017 LTO, a re-assessment was conducted on scenarios 1, 2, 3, 6/6a ,7/7a, and 8/8a using the 2017 LTO generation updates. The study results were not impacted with the use of the 2017 LTO generation updates, as the differences in the study area are minimal.

Scenarios 4, 5

The generation forecast to be used for the studies is based on the 2017 LTO. The generation assumptions for the studies will assume that Sundance units 1 and 2 are retired.

[1] The 2017 LTO is available on the AESO website.

[2] The 2016 LTO is available on the AESO website

[3] In accordance with the AESO Market Update available at: https://www.aeso.ca/market/market-updates/status-of-sundance-unit-1-sd1-and-sundance-unit-2-sd2-effective-january-1-2018/.

Table 4-5: Non-Renewable Generation Dispatch Conditions

Name	Unit	Pmax (MW)	Unit Net Generation[a] in the Study Scenarios (MW)										
			1	2	3	4	5	6	7	8	6a	7a	8a
Interpipeline Strathcona Cogen	G1	50	Not Applicable			Offline (N-G)		60	60	60	60	60	60
	G2	50											
ATCO Heartland Generation Station (P1421)	G1	510	Offline								325	144	330
	G2												
P1289 Maxim Power Deerland Peaking Station	1	45	Offline		112	Offline		Offline		112	Offline		112
	2	45											
	3	45											
	4	45											
Air Liquide 408S	G1	96	185	149	198	153.8	172.8	185	149	198	185	149	198
Scotford Upgrader 879S	GT	99.4											
	ST	95.7											
Alpac	1	43.8	71	65	65	48.7	58.1	71	65	65	71	65	65
	2	43.8											
	3	19.9											
	4	32.1											
Dow Chemical Fort Saskatchewan 166S	G1	99.5	70	29	70	47.3	58.5	70	29	70	70	29	70
	G2	99.5											
Shell Caroline	1	19	7	9	7	5.9	10.1	7	9	7	7	9	7
Fort Saskatchewan Cogen 218S	GT	95	98	81	120	76.6	86	98	81	120	98	81	120
	ST	45.5											

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

4.2.5 Intertie Flow Assumptions

The Alberta-British Columbia (AB-BC), Alberta-Saskatchewan (AB-SK), and Alberta-Montana (MATL) intertie points are deemed to be too far away from the Study Area to have any material impact on the connection assessment. Therefore, intertie flows are assumed to be the same as in the AESO planning base cases and will not be adjusted for in the studies.

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.

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 4-6. These limits must be maintained when performing the studies.

Table 4-6: 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 4-7 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 4-7: Thermal Rating Assumptions for Key Transmission Lines in the Study Area

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)		Emergency Rating (MVA)	
			Summer	Winter	Summer	Winter
1206L	Heartland 12S - Ellerslie 89S	500	2598	2598	3464	3464
1212L	Heartland 12S - Ellerslie 89S	500	2598	2598	3464	3464
997L	Josephburg 410S - Lamoureux 71S	240	499	499	654	748
1120L	Josephburg 410S - Amelia 108S	240	594	706	654	773
921L	Lamoureux 71S - Clover Bar 987S	240	417	499	500	620
942L	Lamoureux 71S - Bannerman 681S	240	499	499	654	748
1054L	Heartland 12S - Deerland 13S	240	594	624	654	773
905L	North Calder 37S - Wabamun 19S	240	421	499	505	624
708L	Lamoureux 71S - Beamer 233S	138	121	148	133	163

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)		Emergency Rating (MVA)	
			Summer	Winter	Summer	Winter
807L	Beamer 233S - Shell AOSP 402S	138	85	90	94	99
807L	Josephburg 410S - Shell AOSP 402S	138	175	217	193	239
EXI-01L	Shell AOSP 402S - Scotford UG 879S	138	216	277	216	286
ALC02L	Scotford 409S - Scotford UG 879S	138	228	273	228	296
856L	Scotford 409S - Josephburg 410S	138	229	275	252	287
857L	Scotford 409S - Josephburg 410S	138	246	287	271	330
776L	Josephburg 410S - Albchem BHC 308S	138	140	140	154	154
773L	Albchem BHC 308S - Bruderheim 127S	138	121	127	133	140
706L	Josephburg 410S - Fort Saskatchewan 54S	138	119	146	131	161
706AL	B.F.Goodrich F.S. 452S - B.F.Goodrich F.S.	138	98	132	108	145
726L	Lamoureux 71S - North Calder 37S	138	169	191	186	228
781L	Lamoureux 71S - Sherritt 172S	138	143	172	172	186
694L	Fort Saskatchewan 54S - Westwood 422S	138	119	146	131	161
707L	Fort Saskatchewan 54S - Dow Chemical 166S	138	119	146	131	161
761L	Lamoureux 71S - East Edmonton 38S	138	98	132	108	145
808L	Redwater 171S – Junction (tap point) 808AL	138	98	114	108	125
808L	Deerland 13S – Junction (tap point) 808AL	138	98	114	108	125
815L	Bruderheim 127S - Deerland 13S	138	141	163	155	179
735L	Beamer 233S - Redwater 171S	138	96	94	125	103
636L	Broadmoor 420S - Sherwood Park 746S	138	119	146	131	161

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 4-8.

Table 4-8: Summary of Key Transformer Ratings in the Study Area

Substation Name and Number	Transformer ID	Transformer Voltages (kV)	Transformer Rating (MVA)
Josephburg 410S	T1	240/138	336
	T2	240/138	336
Lamoureux 71S	T1	240/138	448
	T2	240/138	400
North Calder 37S	T6	240/138	286.8
Deerland 13S	T2	240/138	286.8

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 4-9.

Table 4-9: 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)
Fort Saskatchewan 54S	138	1	48.91	-	-
Lamoureux 71S	138	2	97.82	-	-
Bruderheim 127S	138	1	45	-	-

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 4-10. Only those contingencies shown in Table 4-10 will be studied for transient stability studies. If the TFO(s) do/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 4-10: Protection Fault Clearing Times

Contingency (System Element Lost)	Fault Location	Clearing Times (Cycles)	
		Near End	Far End
997L (Lamoureux 71S - Josephburg 410S)	Lamoureux 71S	5	6
997L (Josephburg 410S - Lamoureux 71S)	Josephburg 410S	5	6
1120L (Josephburg 410S - Amelia 108S)	Josephburg 410S	5	6
1120L (Amelia 108S - Josephburg 410S)	Amelia 108S	5	6
943L(Deerland 13S - Amelia 108S)	Deerland 13S	5	6
943L(Amelia 108S - Deerland 13S)	Amelia 108S	5	6
410S T1(Josephburg 410S 240kV - Josephburg 410S 138 kV)	Josephburg 410S 240kV	5	6
410S T1(Josephburg 410S 240kV - Josephburg 410S 138 kV)	Josephburg 410S 138 kV	5	6
920L(Lamoureux 71S - Castle Downs 557S)	Lamoureux 71S	5	6
920L(Castle Downs 557S - Lamoureux 71S)	Castle Downs 557S	5	6
1054L(Deerland 13S - Heartland 12S)	Deerland 13S	5	6
1054L(Heartland 12S - Deerland 13S)	Heartland 12S	5	6
1061L(Bannerman 681S - Heartland 12S)	Bannerman 681S	5	6
1061L(Heartland 12S - Bannerman 681S)	Heartland 12S	5	6
942L(Lamoureux 71S - Bannerman 681S)	Lamoureux 71S	5	6
942L(Bannerman 681S - Lamoureux 71S)	Bannerman 681S	5	6
13S T1(Deerland 13S 240 kV - Deerland 13S 138 kV)	Deerland 13S 240 kV	6	6
13S T1(Deerland 13S 240 kV - Deerland 13S 138 kV)	Deerland 13S 138 kV	6	6
776L(Josephburg 410S - Beaverhill Ck 308S)	Josephburg 410S	6	7
776L(Beaverhill Ck 308S - Josephburg 410S)	Beaverhill Ck 308S	6	7
773L(Bruderheim 127S - Beaverhill Ck 308S)	Bruderheim 127S	5.5	6.5
773L(Beaverhill Ck 308S - Bruderheim 127S)	Beaverhill Ck 308S	5.5	6.5
815L(Deerland 13S - Bruderheim 127S)	Deerland 13S	5.5	6.5
815L(Bruderheim 127S - Deerland 13S)	Bruderheim 127S	5.5	6.5
808L(Redwater 171S - Deerland 13S)	Redwater 171S	5	6
808L(Deerland 13S - Redwater 171S)	Deerland 13S	5	6
735L(Redwater 171S - Beamer 233S)	Redwater 171S	6	7
735L(Beamer 233S - Redwater 171S)	Beamer 233S	6	7
708L(Lamoureux 71S - Beamer 233S)	Lamoureux 71S	6	7
708L(Beamer 233S - Lamoureux 71S)	Beamer 233S	6	7
807L(Josephburg 410S - Beamer 233S)	Josephburg 410S	6	6
807L(Beamer 233S - Josephburg 410S)	Beamer 233S	6	6

4.2.9 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

5.1 Engineering Studies

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

Table 5-1: Summary of Engineering 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	2020 SP	X	X							
2	2020 SL	X	X							
3	2020 WP	X	X							X
Post-Project										
4	2020 SP DTS	X*	X*							
5	2020 WP DTS	X*	X*	X*	X*					
6	2020 SP STS	X	X			X**	X**			
7	2020 SL STS	X	X			X**	X**			
8	2020 WP STS	X	X			X**	X**			X
9	2028 WP STS									X
Post-Project Sensitivity Heartland Generating Station Interconnection (P1421 assumed in service)										
6a	2020 SP STS	X	X			X**	X**			
7a	2020 SL STS	X	X			X**	X**			
8a	2020 WP STS	X	X			X**	X**			X

*Pre-Project studies for the DTS component (low cogeneration scenarios) will only be performed if performance issues are identified in the Post-Project studies.

**Pre-Project transient stability studies will only be performed if performance issues are identified in the Post-Project studies.

For the engineering studies, all transmission facilities 69 kV and above, within the Study Area and the transmission lines connecting these planning area(s) 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).

5.2 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 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 and cases 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.

5.3 Voltage Stability Studies

The objective of the voltage stability studies is to determine the ability of the transmission system to maintain voltage stability margin at all busses under Category A and Category B conditions. The power-voltage (PV) curve is a representation of voltage change as a result of increased power transfer between two systems. The incremental transfers will be reported at the collapse point.

Voltage stability studies will be performed for the post-Project scenarios. For load connection projects, the load level modeled in post-Project scenarios is the same as, or higher than, in pre-Project scenarios. Therefore, voltage stability studies for pre-Project scenarios will only be performed if post-Project scenarios show voltage stability criteria violations.

Voltage stability studies will be performed according to the Western Electricity Coordinating Council (WECC) Voltage Stability Assessment Methodology. WECC voltage stability criteria states, for load areas, post-transient voltage stability margin is required for the area modeled at a minimum of 105% of the reference load level for Category A conditions and for Category B conditions. For this standard, the reference load level is the maximum established planned load.

Typically, voltage stability studies are carried out assuming the worst case scenarios in terms of loading. In this connection assessment, the voltage stability studies will be performed by increasing load in Fort Saskatchewan (Area 33) and increasing generation in Wabamun (Area 40) and Fort McMurray (Area 25).

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

5.3.1 Contingencies to be Studied

Voltage stability studies will be performed for all Category B contingencies in the Study Area. The Category A condition and the five contingencies with the smallest stability margin will be presented in the results.

5.4 Transient Stability Studies

The Keephills #3 unit 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 various variables including rotor angle, and active and reactive power output for all generators in the Study Area. 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.

5.4.1 Contingencies to be Studied

Transient stability studies will be performed for the contingencies shown in Table 4-10.

5.5 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:

- New customer switching station (Ursus 430S)
- Josephburg 410S
- Deerland 13S
- Lamoureux 71S
- Sherritt 172S
- Beamer 233S
- Fort Saskatchewan 54S
- Scotford 409S
- Riverside 388S
- Dow Hydro 258S
- Shell 402S
- Albchem 308S

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 shown in Table 5-1.

6 Mitigation Measures

6.1 Development

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

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

- Develop tables showing the constraint effective factors[4] 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.

[4] 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.

Attachment A: Transmission Planning Criteria – Basis and Assumptions

Transmission Planning Criteria – Basis and Assumptions

Version 1.1

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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 these standards is given in: AESO. *Alberta Reliability Standards*. Available at: 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	152
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

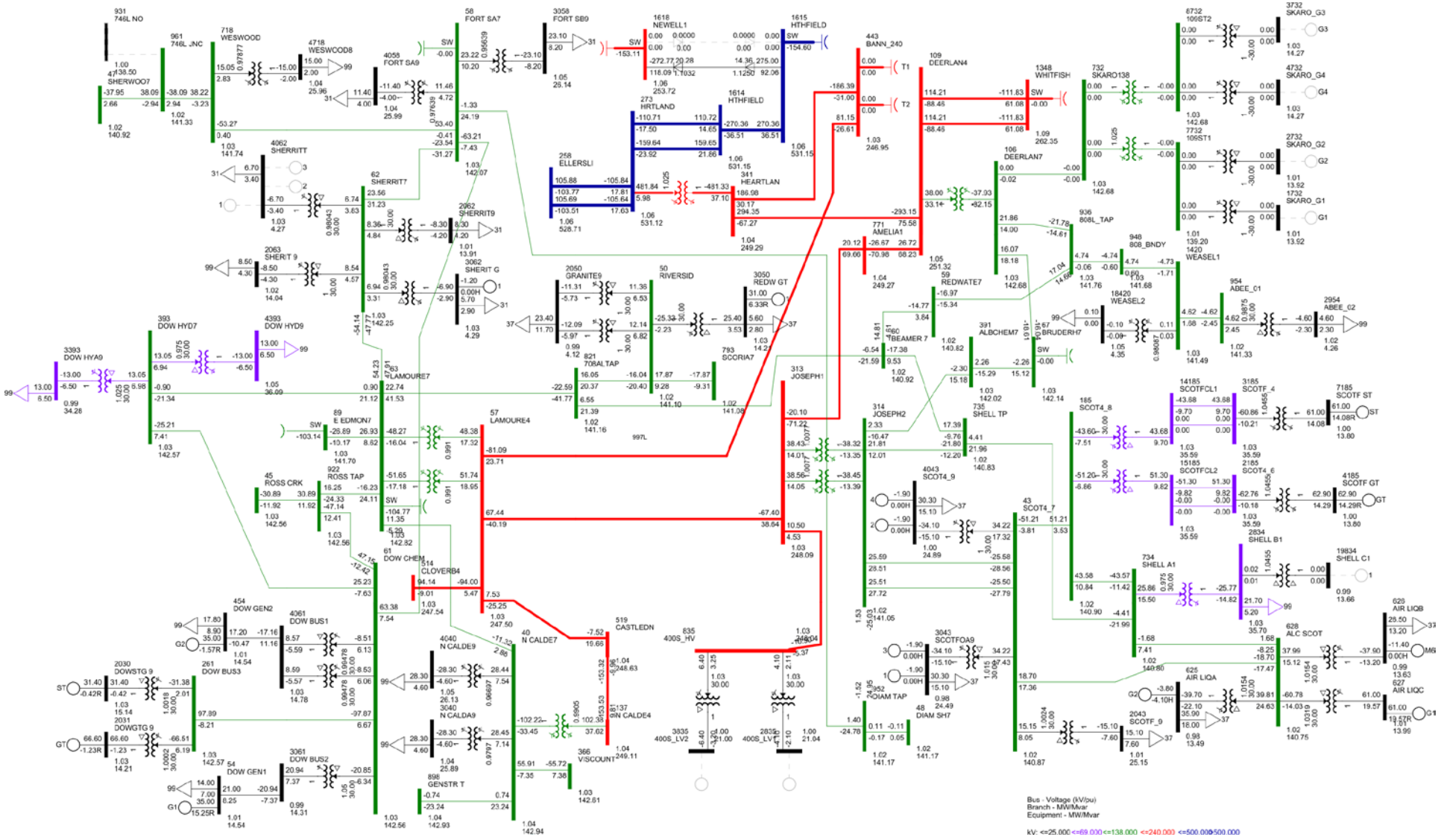


Figure A-1 : 2020 Summer Peak, Scenario 1

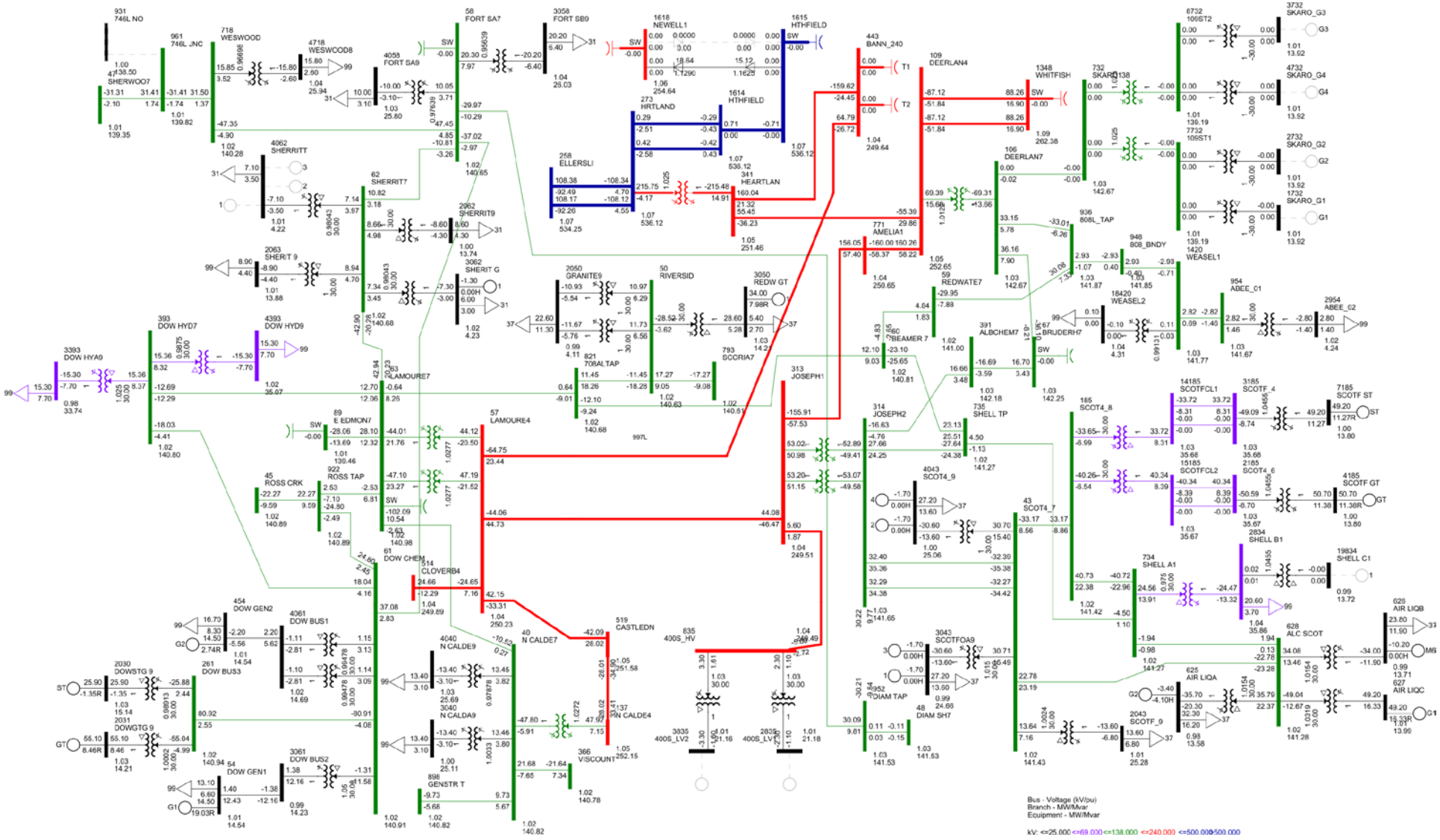


Figure A-2 : 2020 Summer Light, Scenario 2

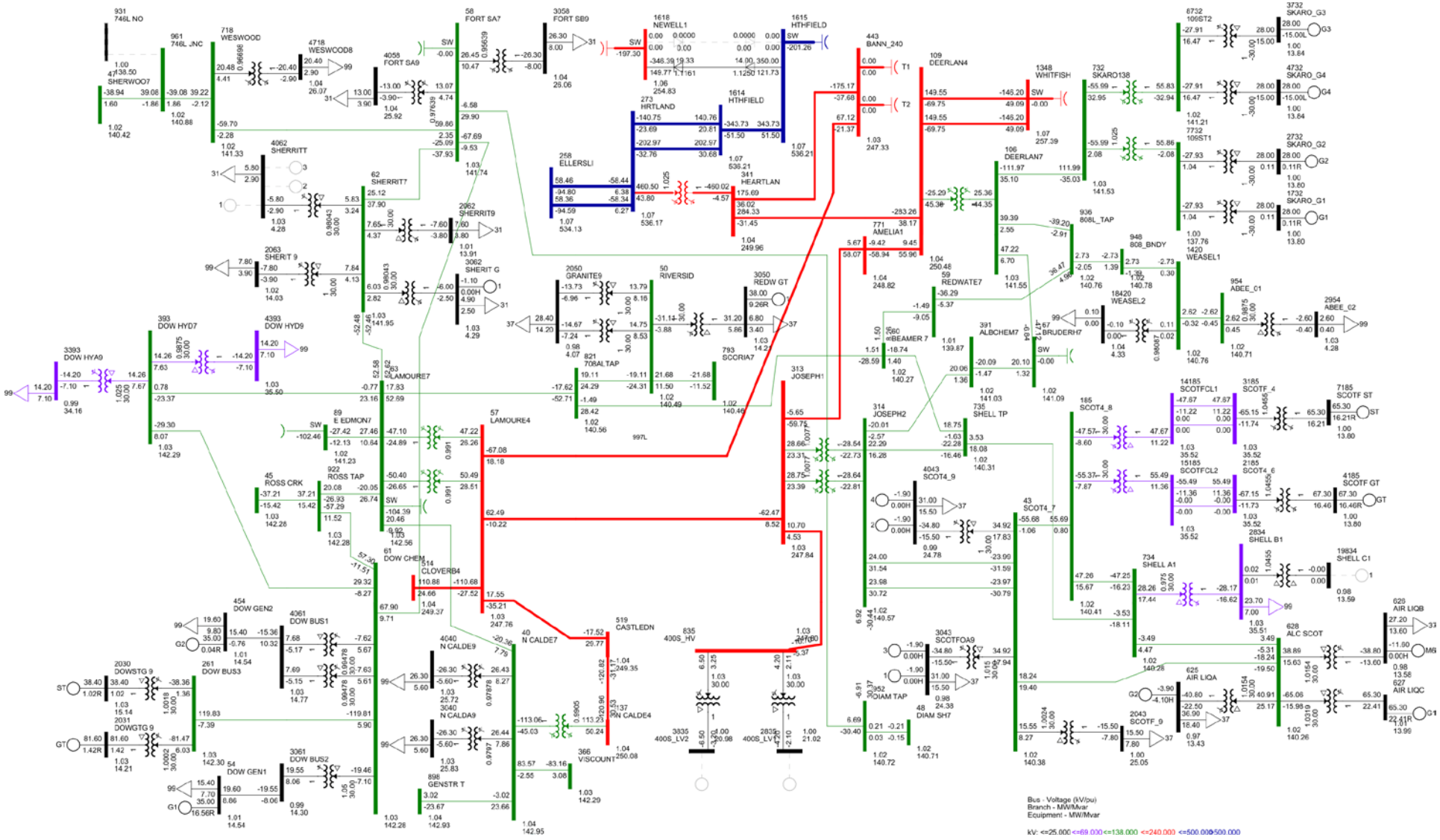


Figure A-3 : 2020 Winter Peak, Scenario 3

Attachment A3
Post-Project Power Flow Diagrams

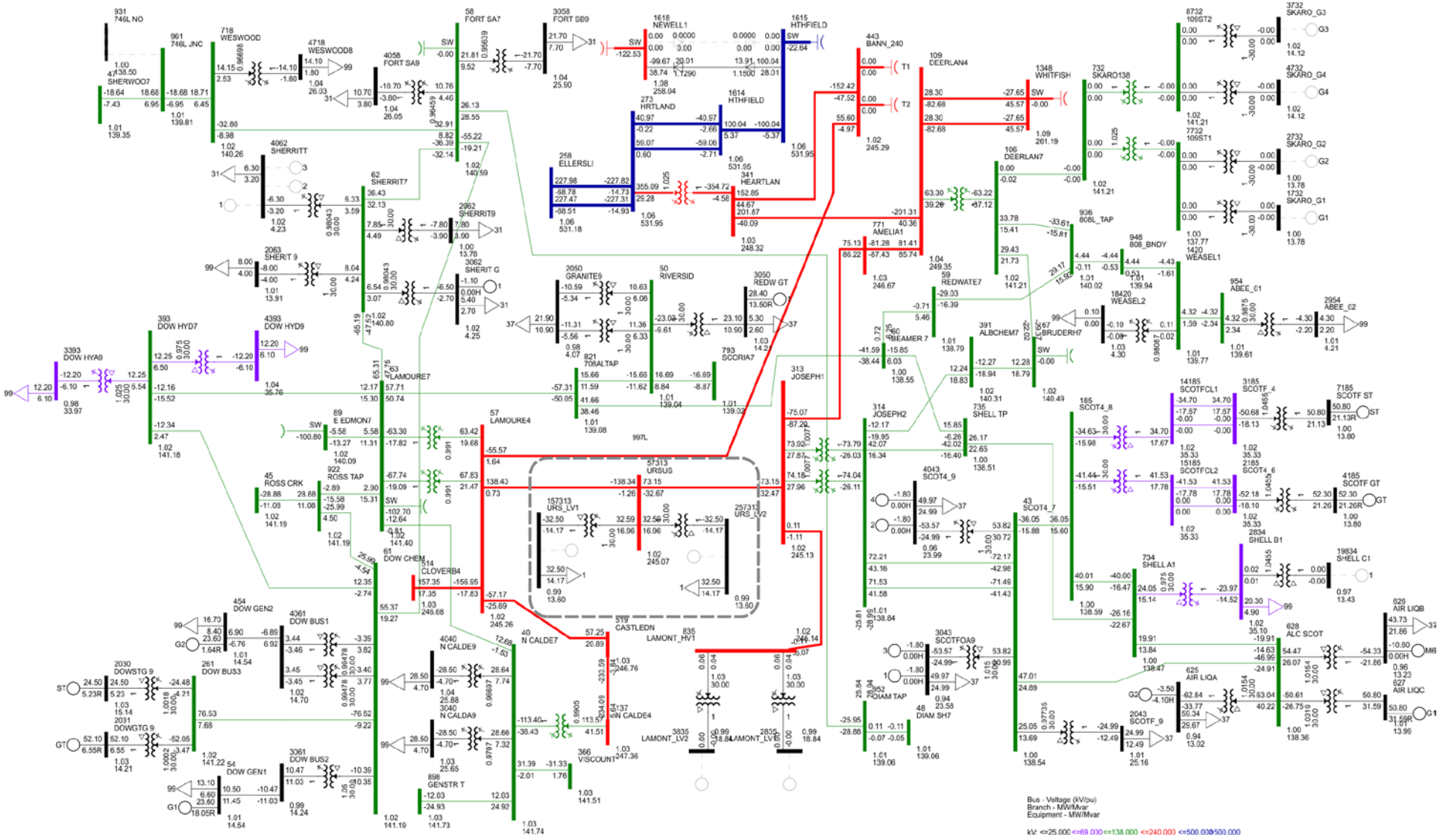


Figure A-4 : 2020 Summer Peak, Scenario 4

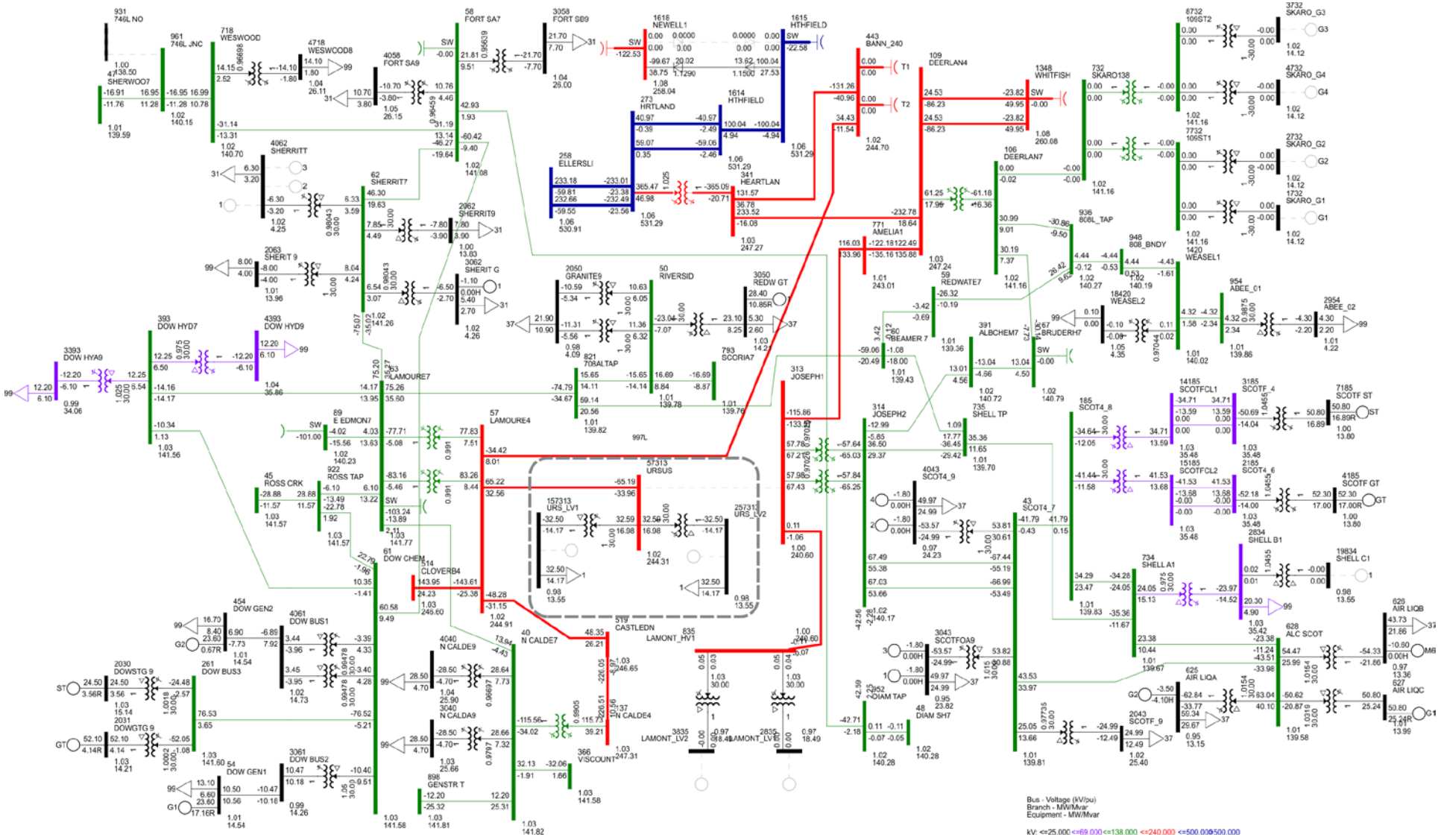


Figure A-5 : 2020 Summer Peak, Scenario 4 - Josephburg410S – Ursus 430S 1027L out

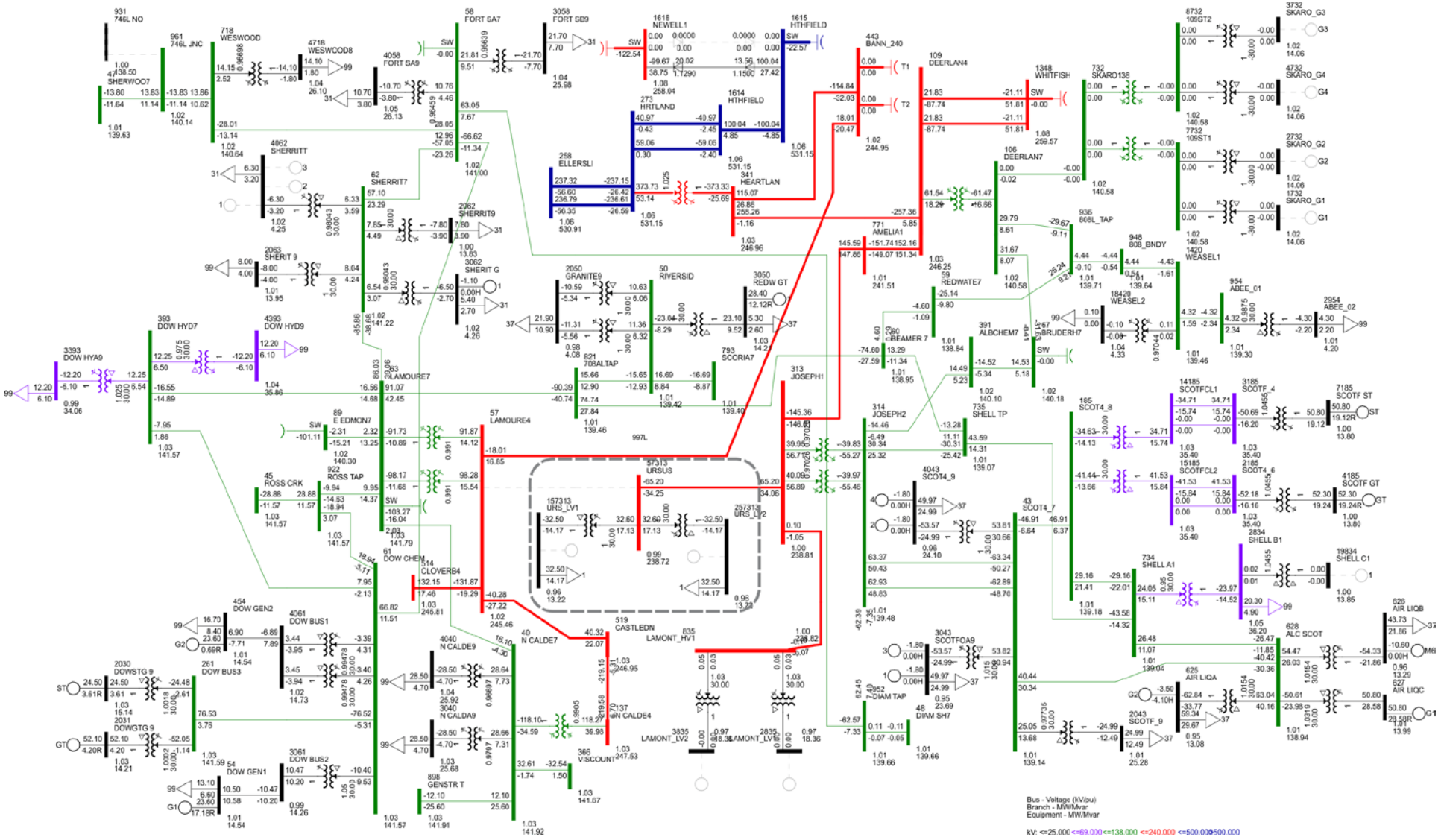


Figure A-6 : 2020 Summer Peak, Scenario 4 – Lamoureux 71S – Ursus 430S 997L out

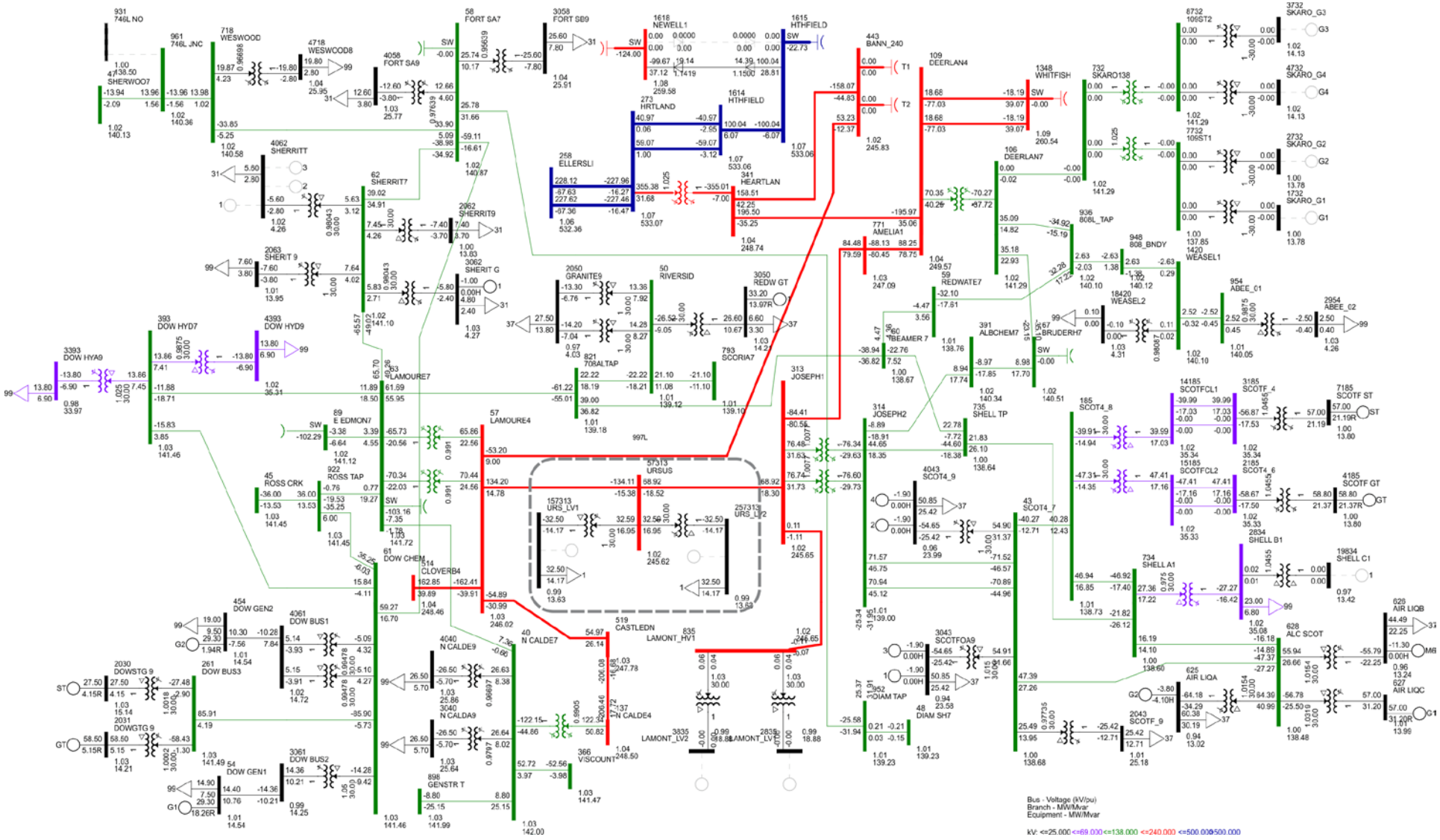


Figure A-7 : 2020 Winter Peak, Scenario 5

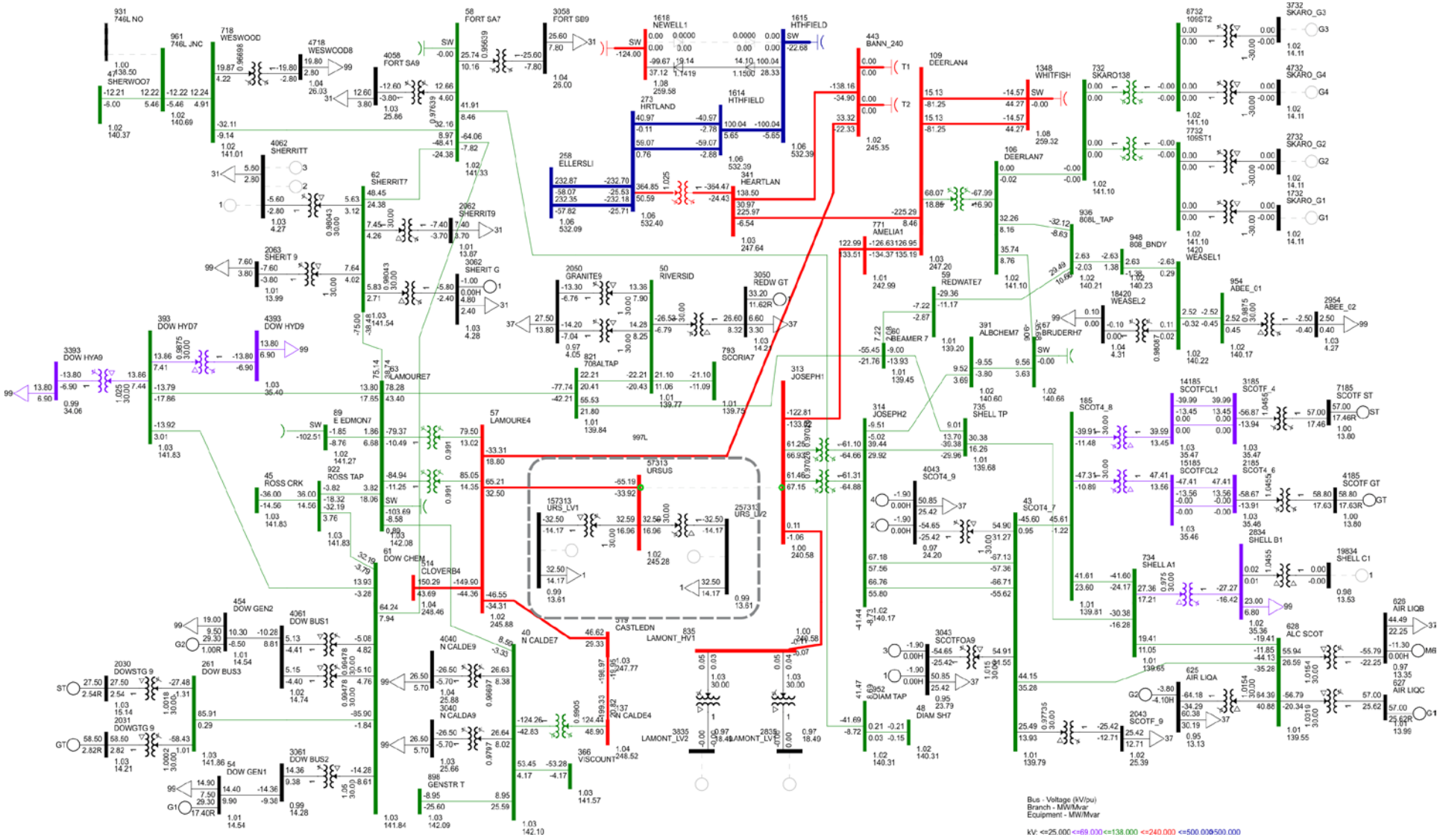


Figure A-8 2020 Winter Peak, Scenario 5 – Josephburg 410S – Ursus 430S 1027L out

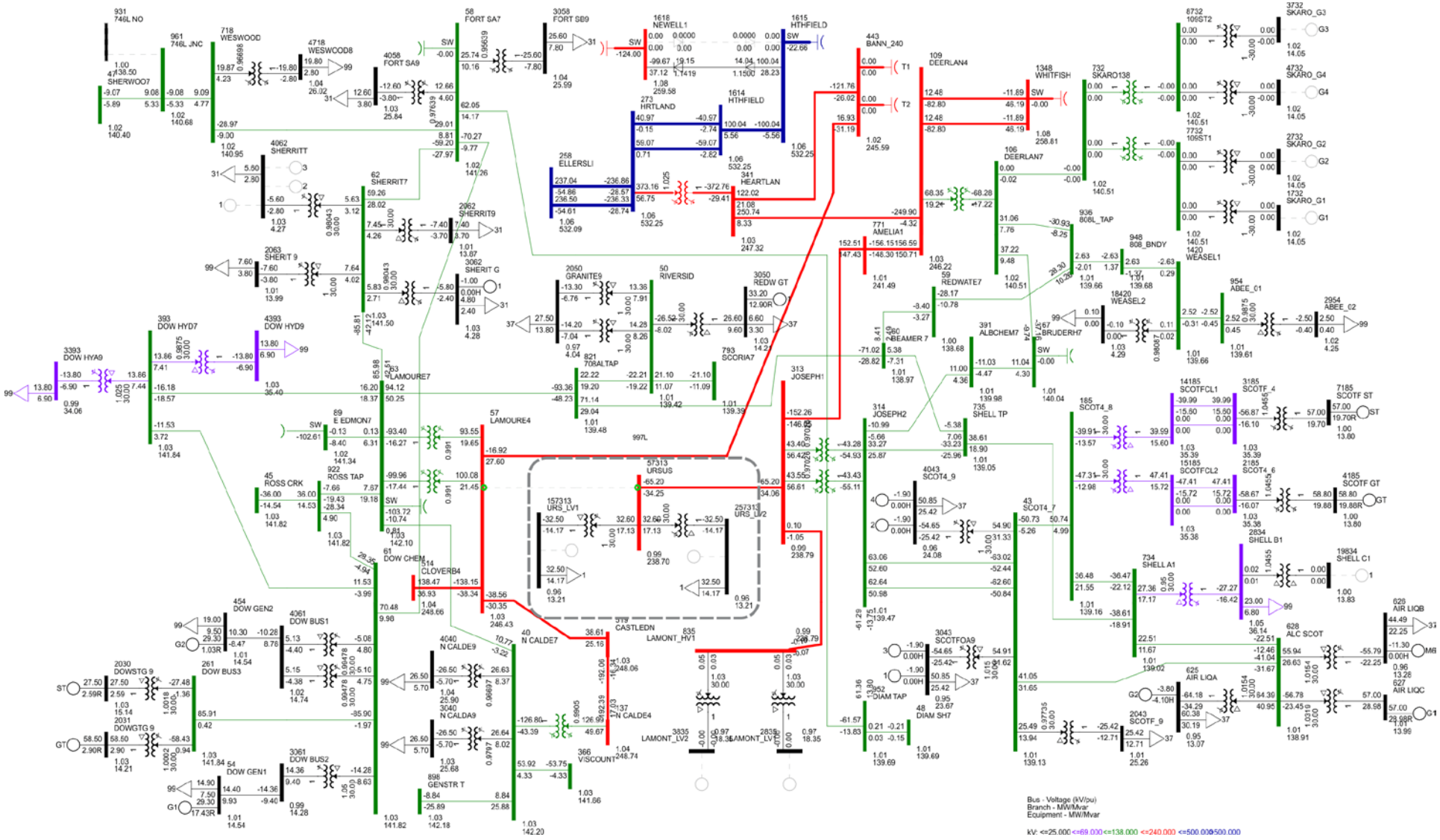


Figure A-9 2020 Winter Peak, Scenario 5 – Lamoureux 71S – Ursus 430S 997L out

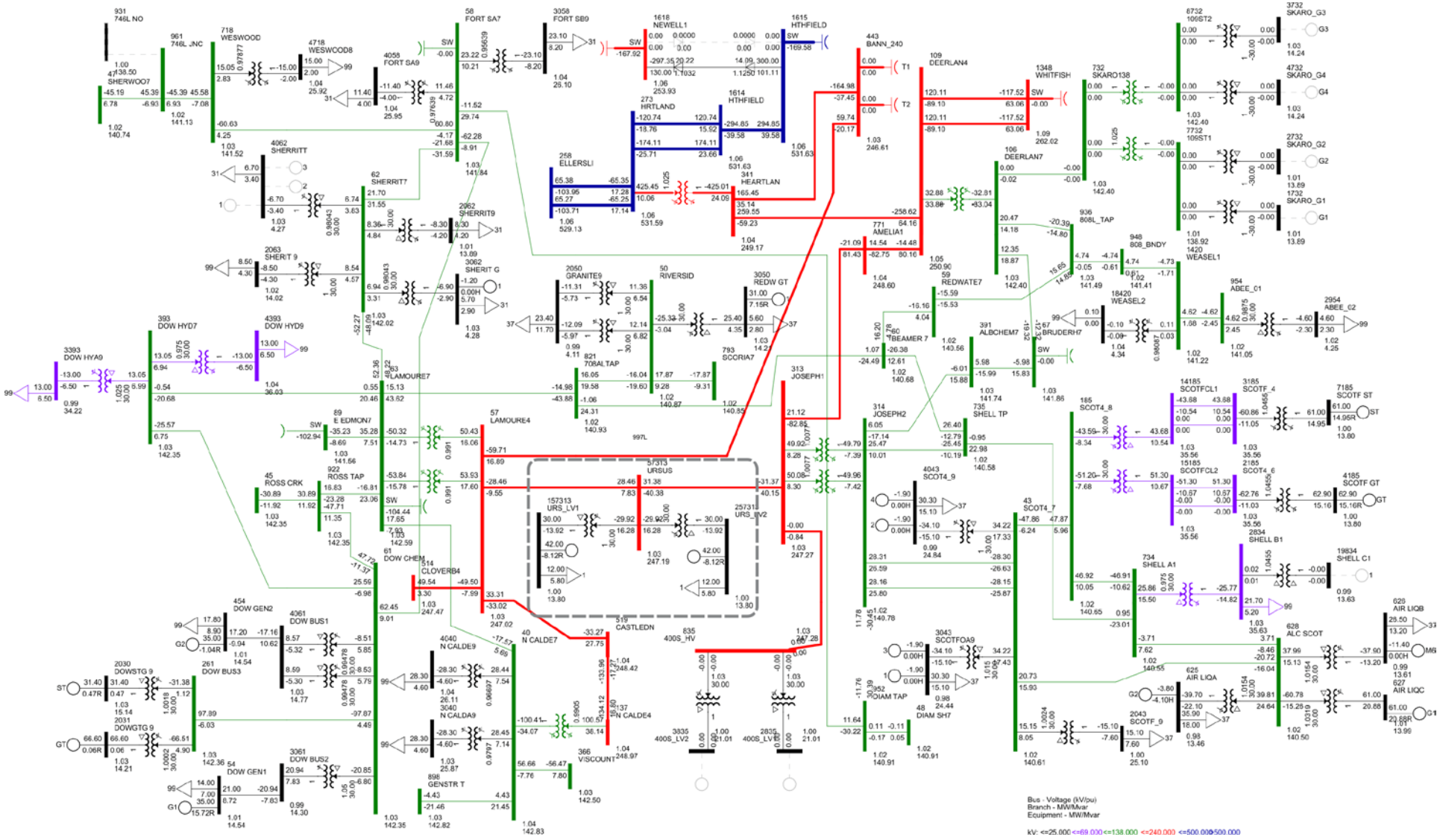


Figure A-10 : 2020SP Post-Project STS, Scenario 6

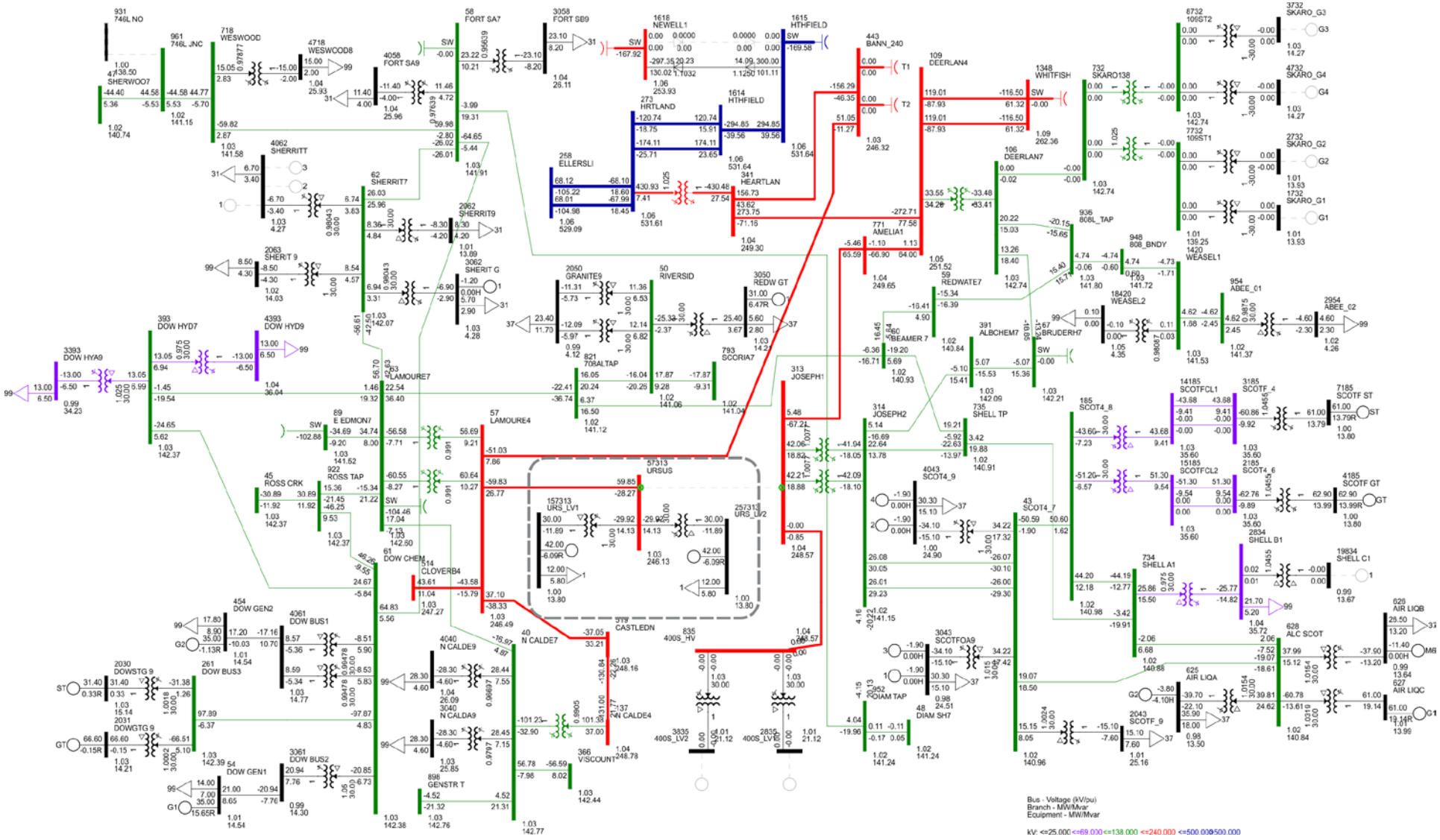


Figure A-11 : 2020SP Post-Project STS, Scenario 6 – Josephburg 410S – Ursus 430S 1027L out

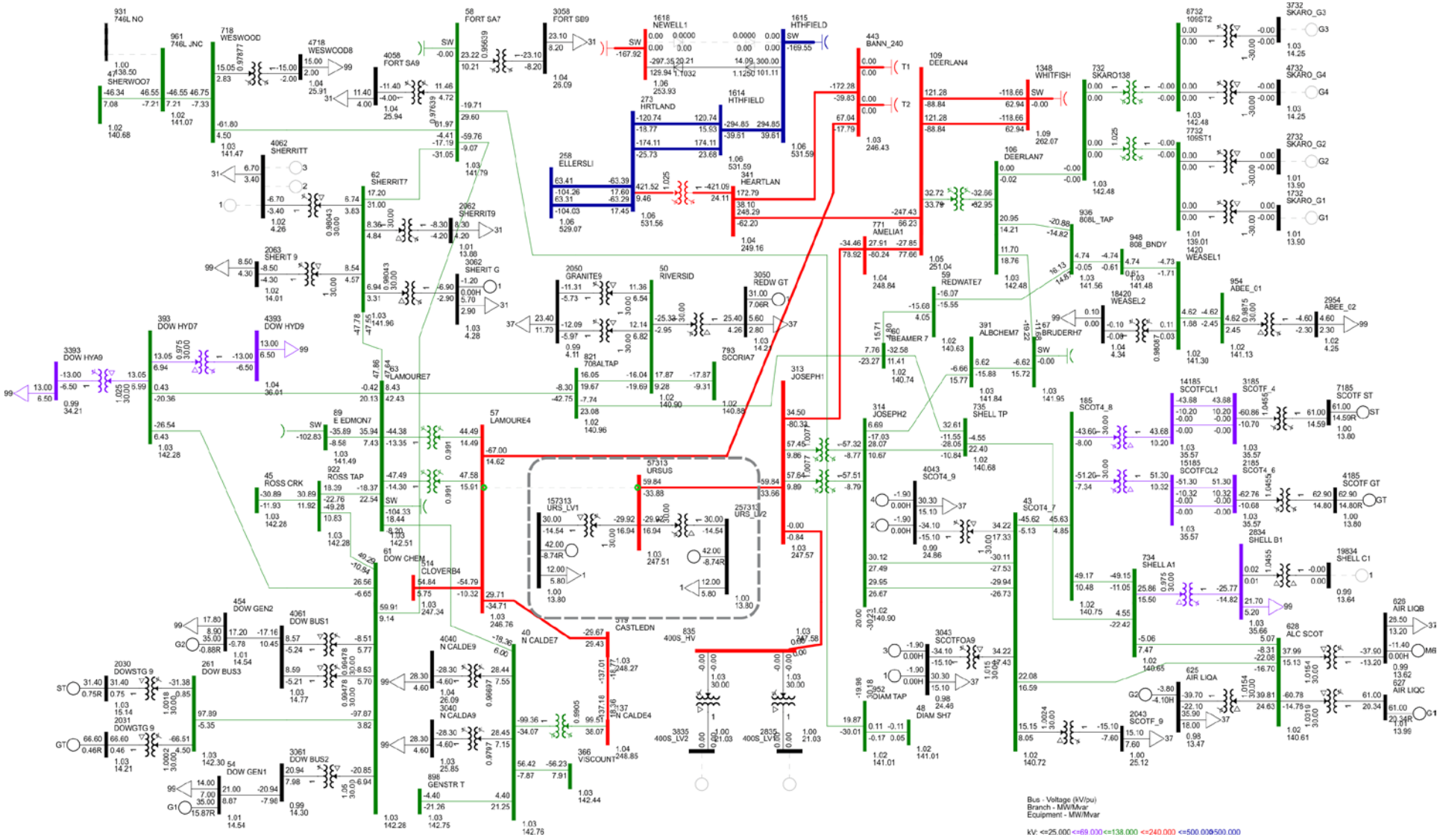


Figure A-12 : 2020SP Post-Project STS, Scenario 6 – Lamoureux 71S – Ursus 430S 997L out

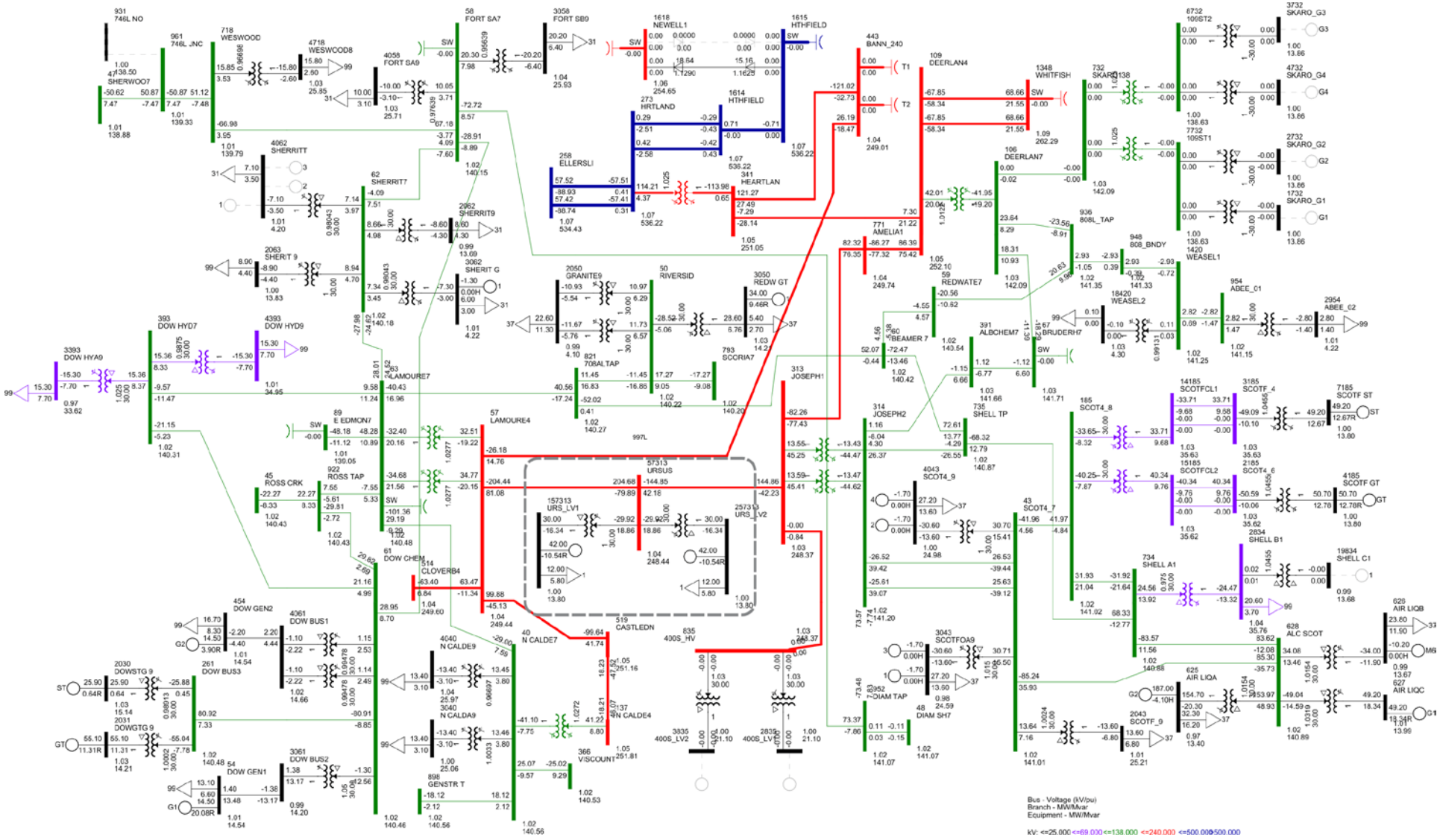


Figure A-13 : 2020SL Post-Project STS, Scenario 7

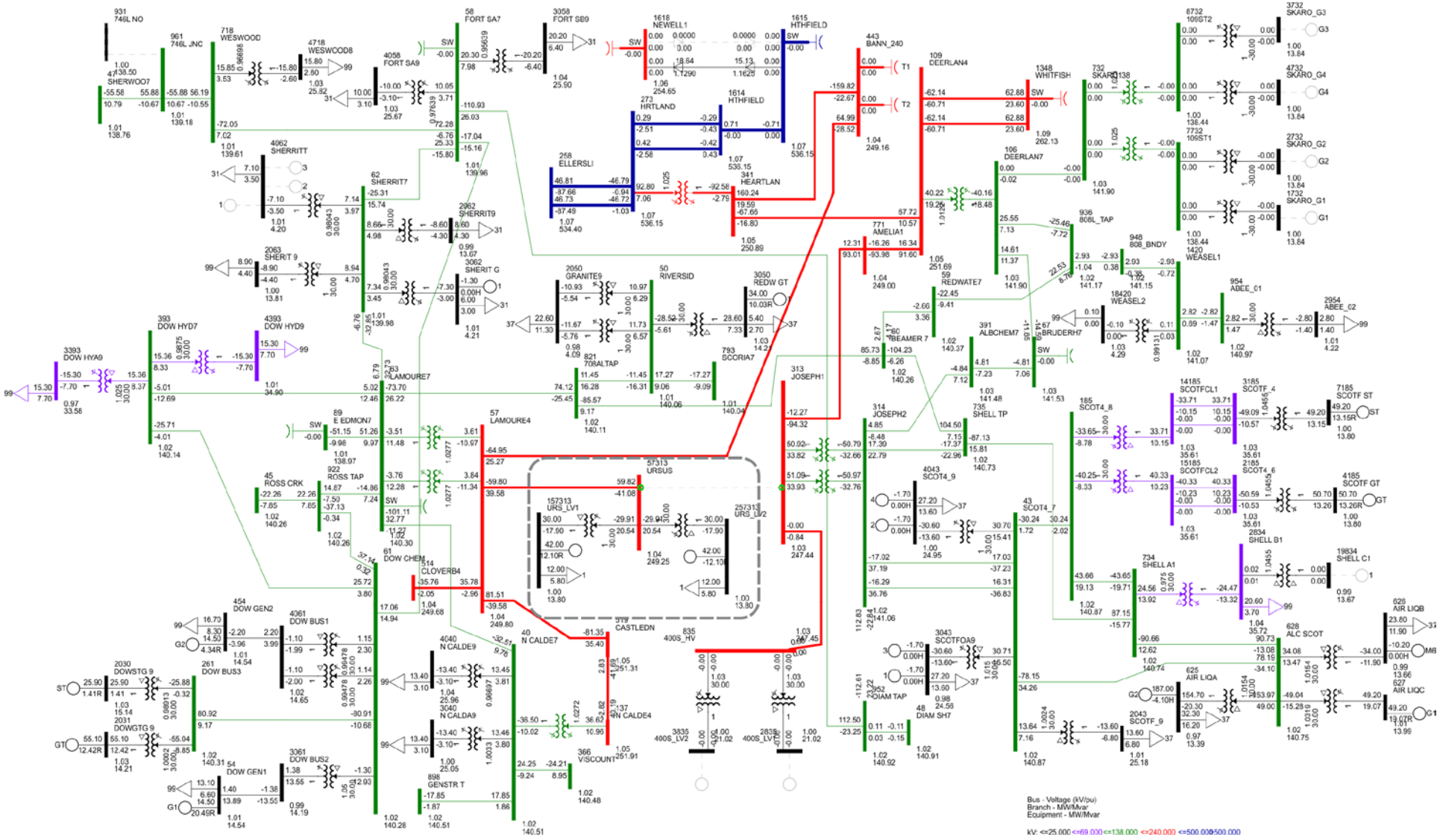


Figure A-14 : 2020SL Post-Project STS, Scenario 7 – Josephburg 410S – Ursus 430S 1027L out

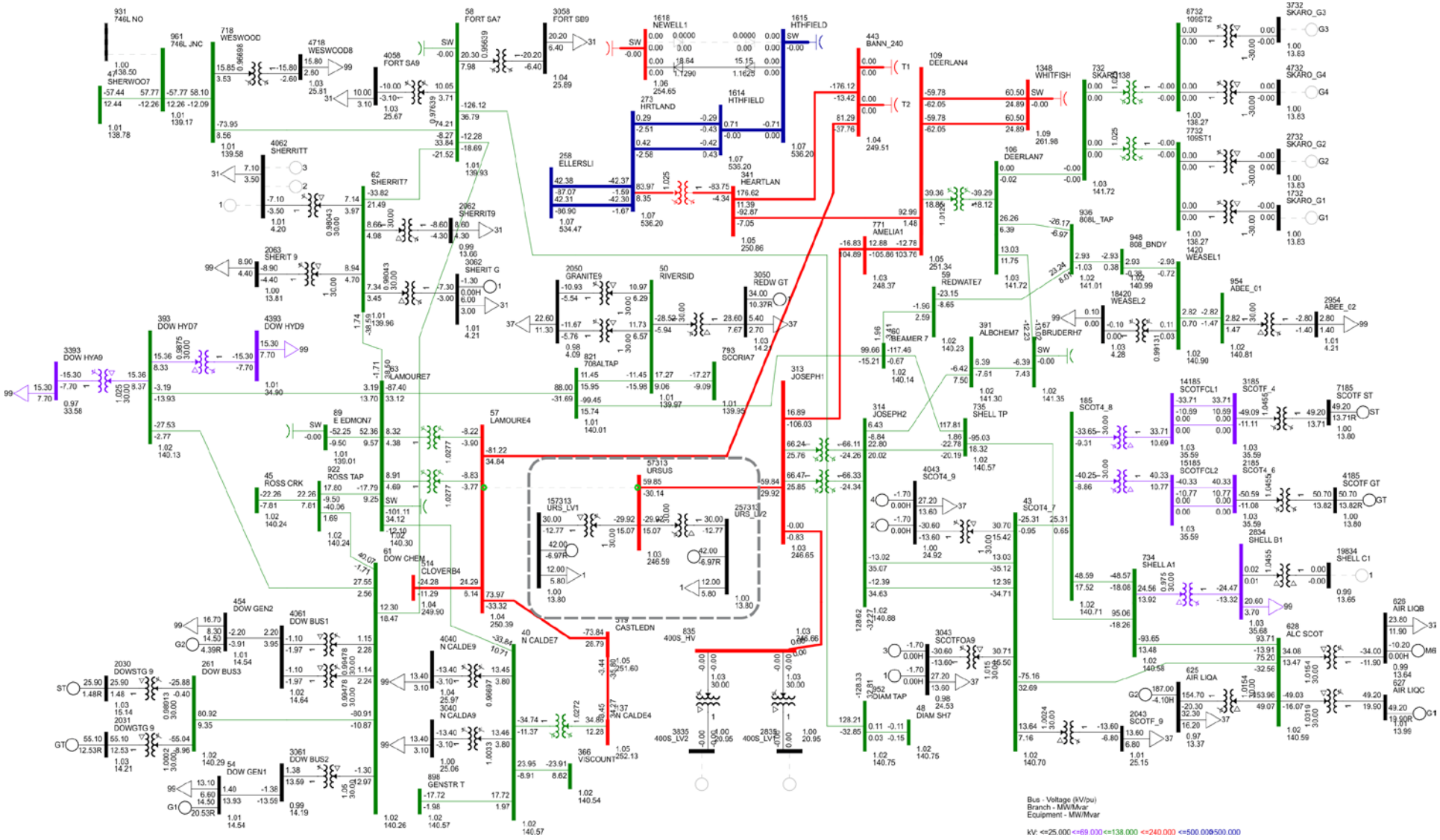


Figure A-15 : 2020SL Post-Project STS, Scenario 7 – Lamoureux 71S – Ursus 430S 997L out

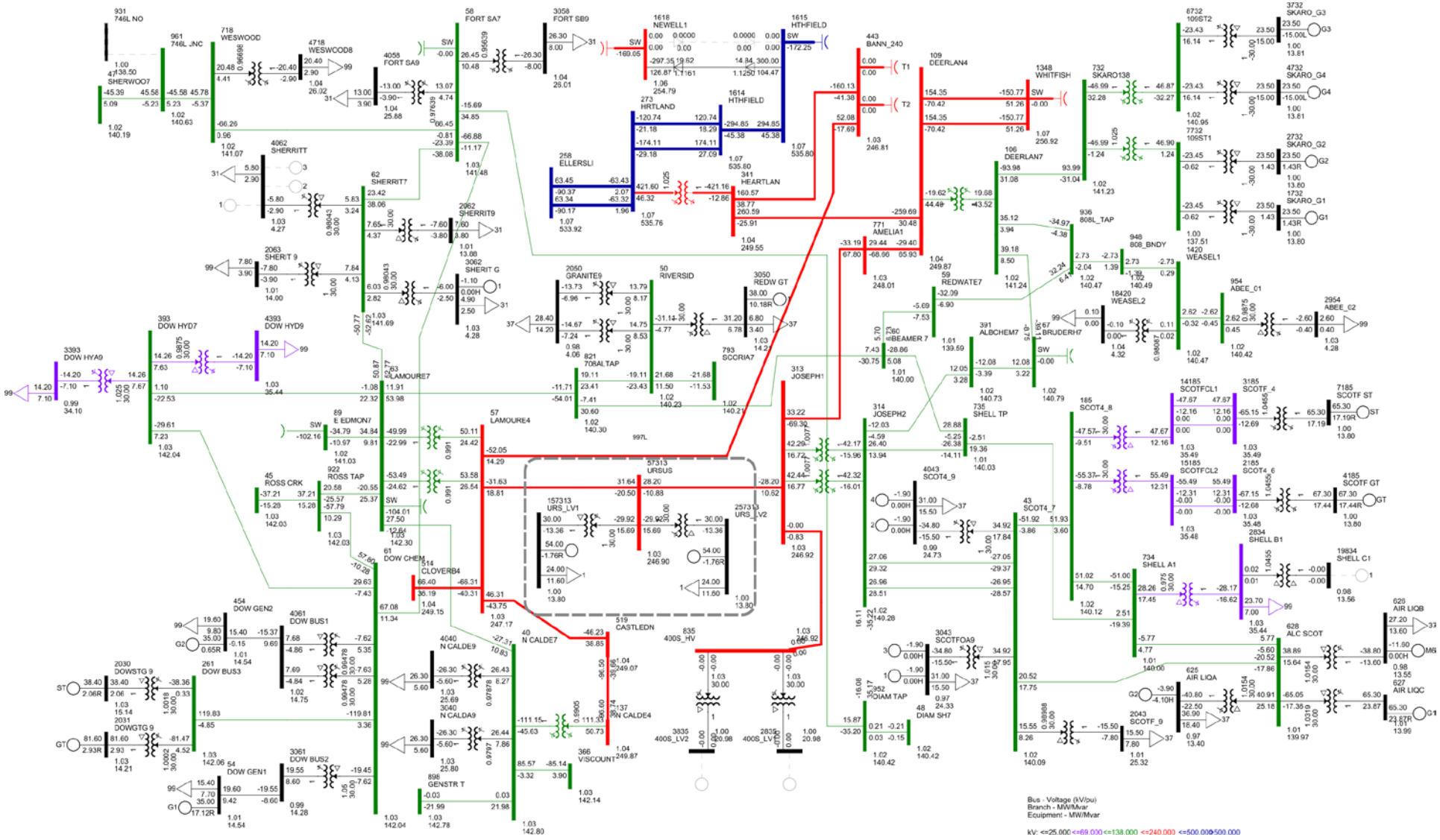


Figure A-16 : 2020WP Post-Project STS, Scenario 8

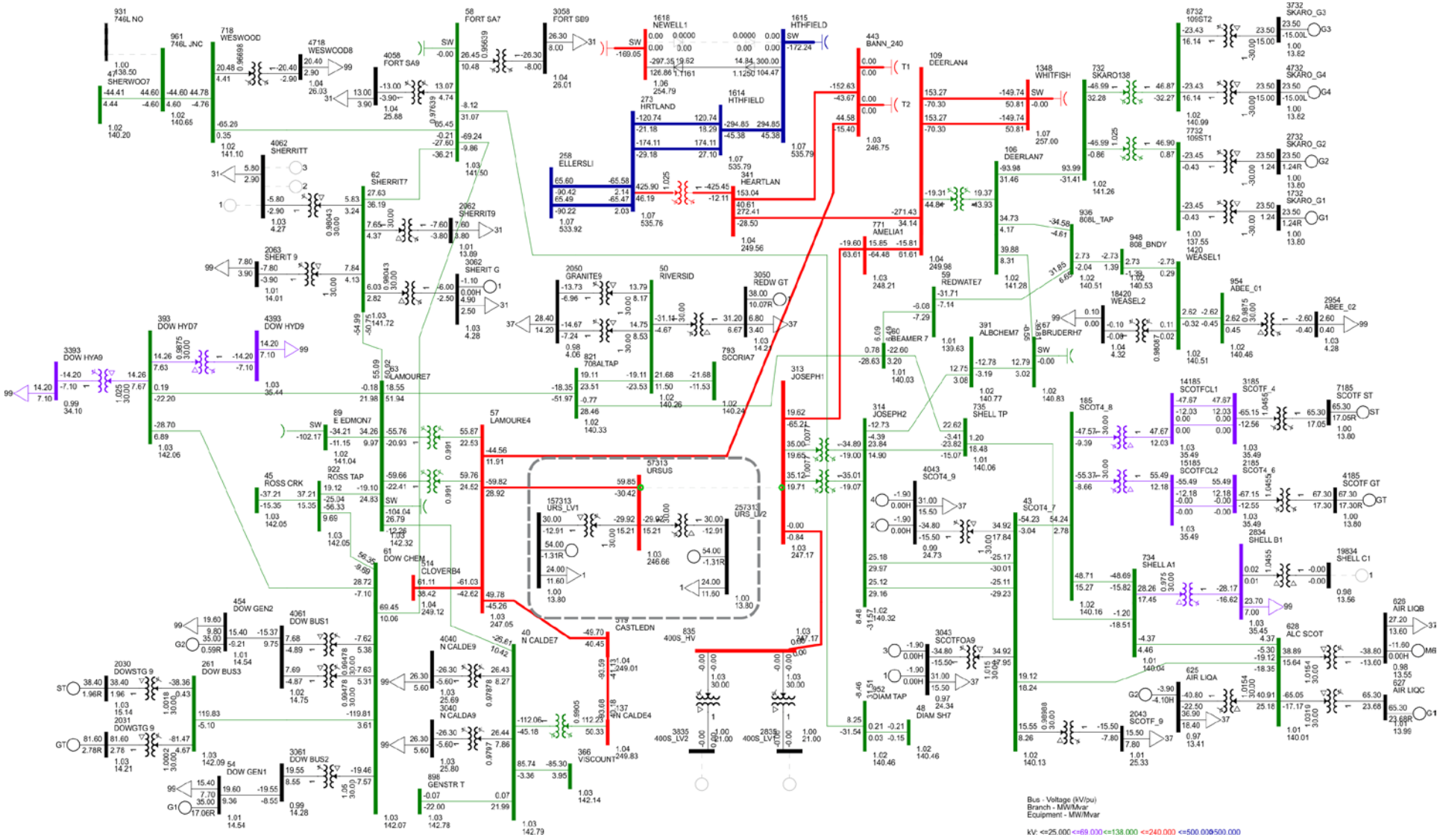


Figure A-17 : 2020WP Post-Project STS, Scenario 8 – Josephburg 410S – Ursus 430S 1027L out

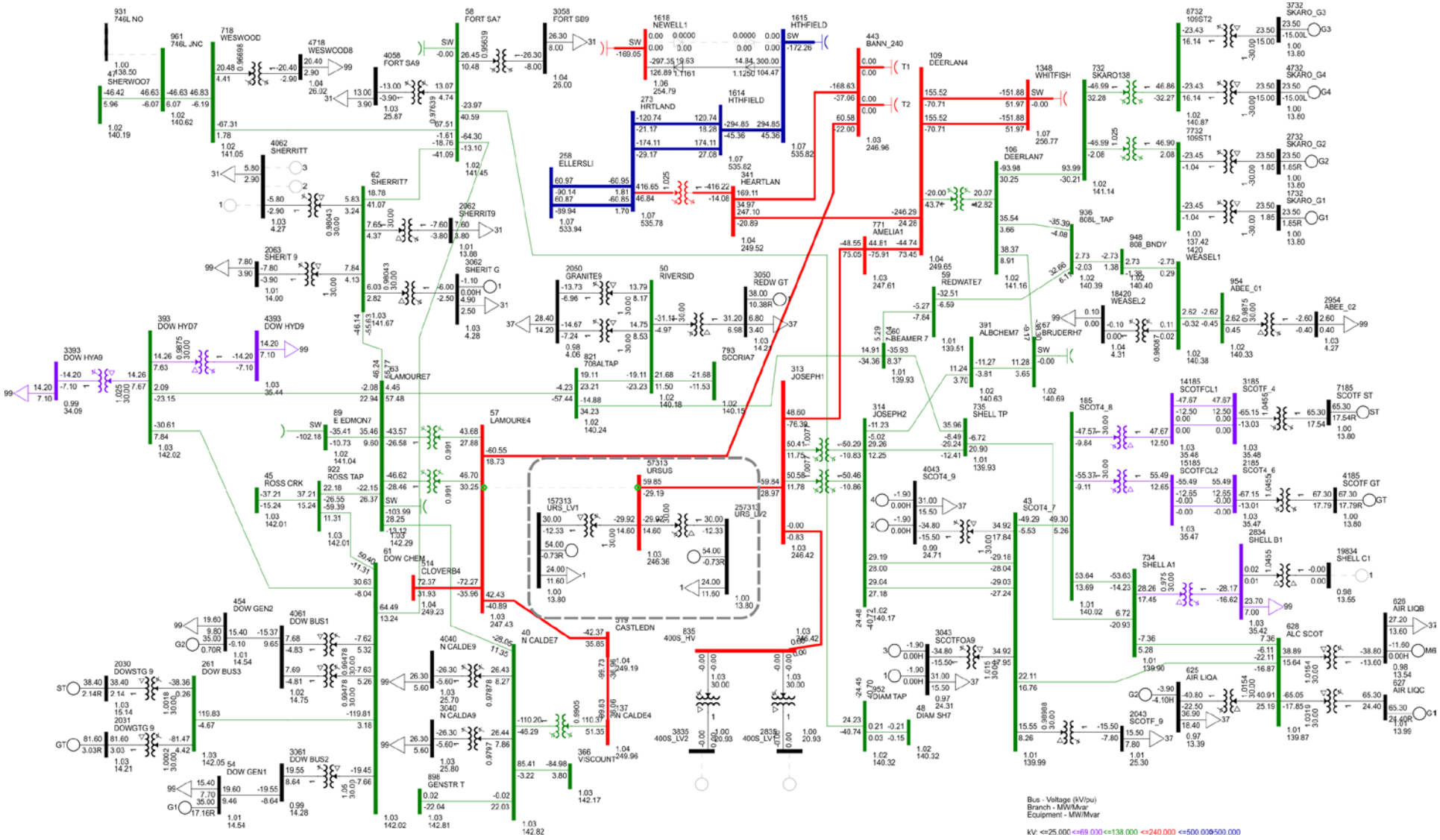


Figure A-18 : 2020WP Post-Project STS, Scenario 8 – Lamoureux 71S – Ursus 430S 997L out

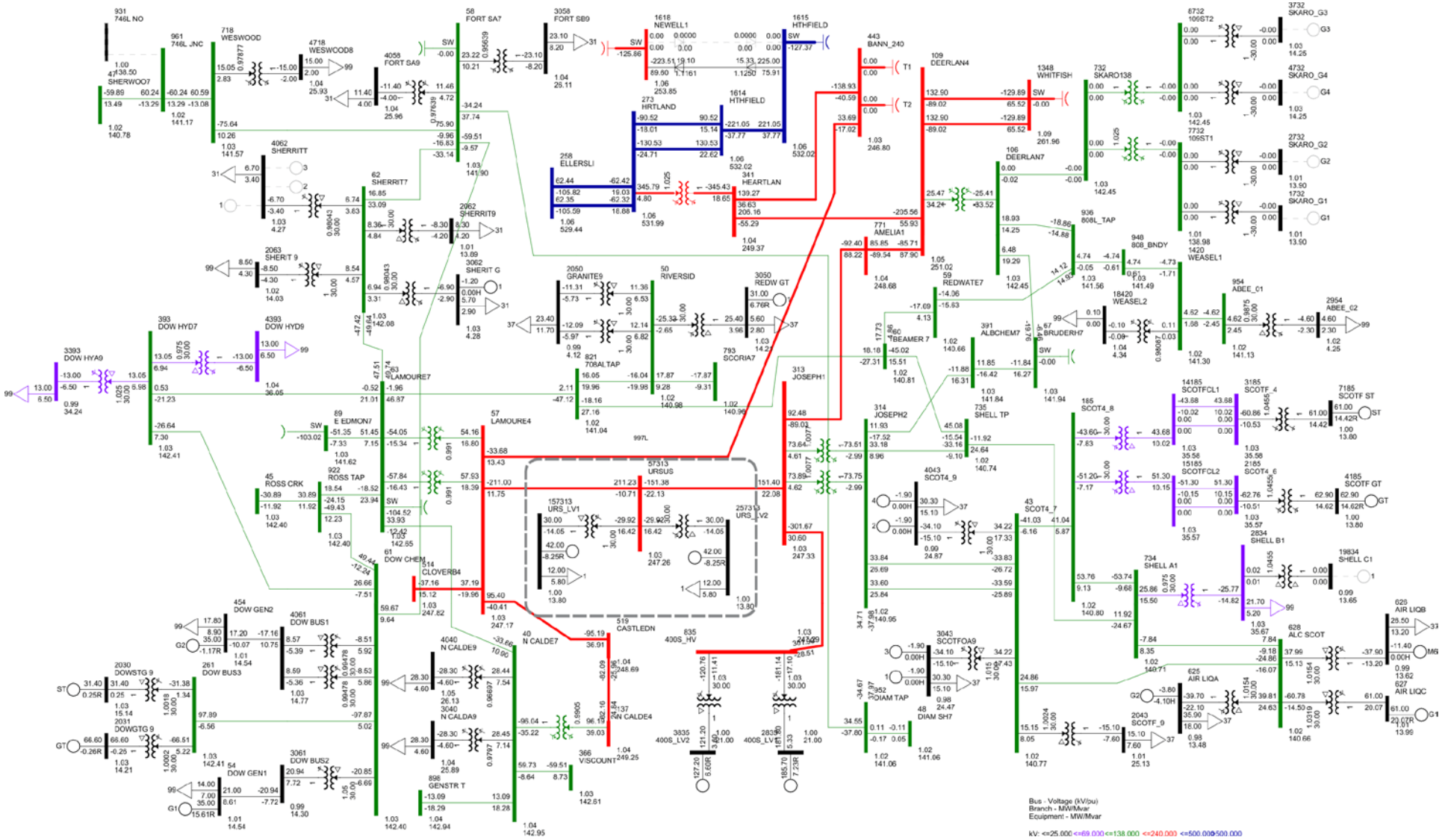


Figure A-19 : 2020SP Post-Project STS (P1421), Scenario 6a

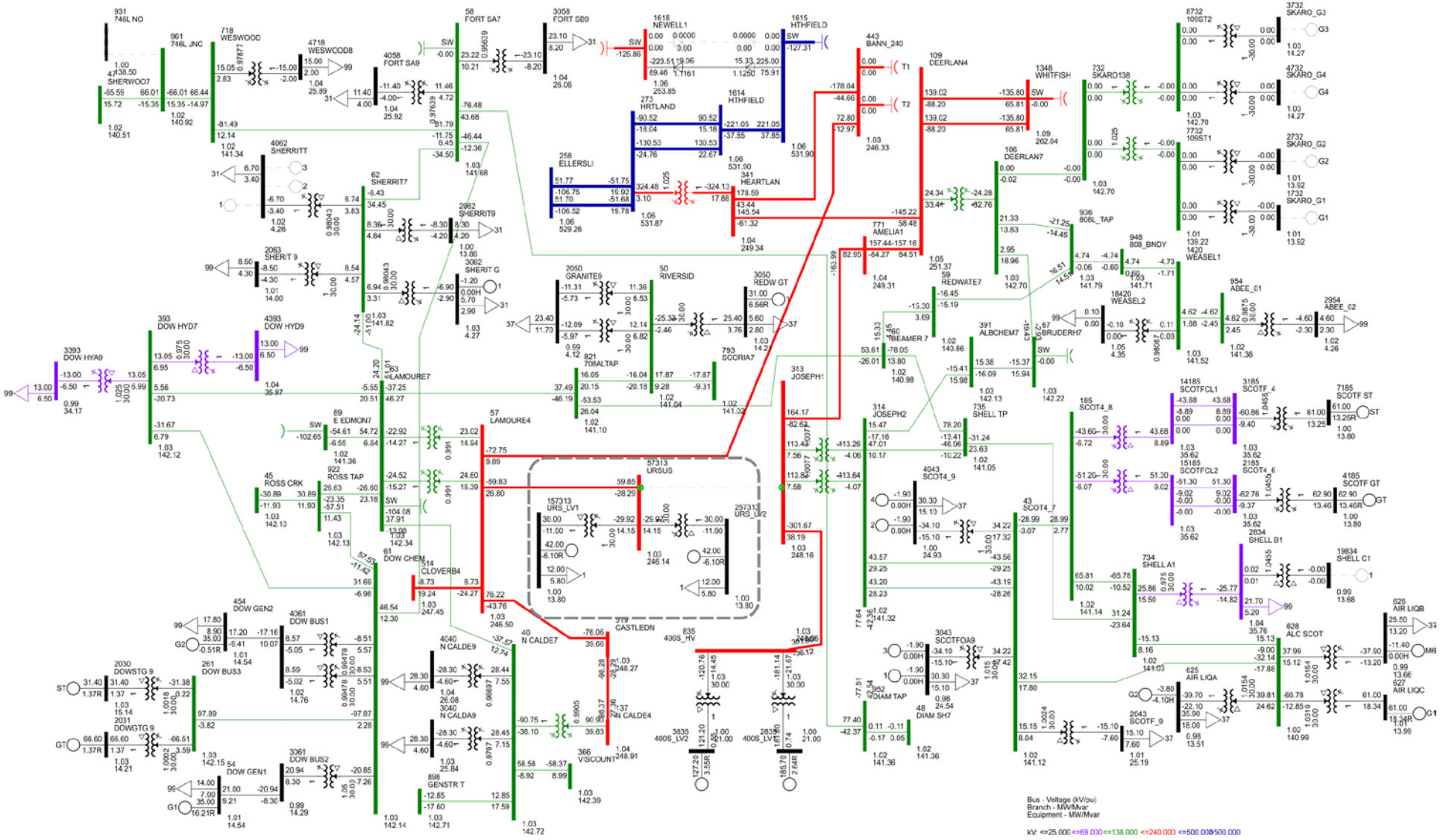


Figure A-20 : 2020SP Post-Project STS (P1421), Scenario 6a – Josephburg 410S – Ursus 430S 1027L out

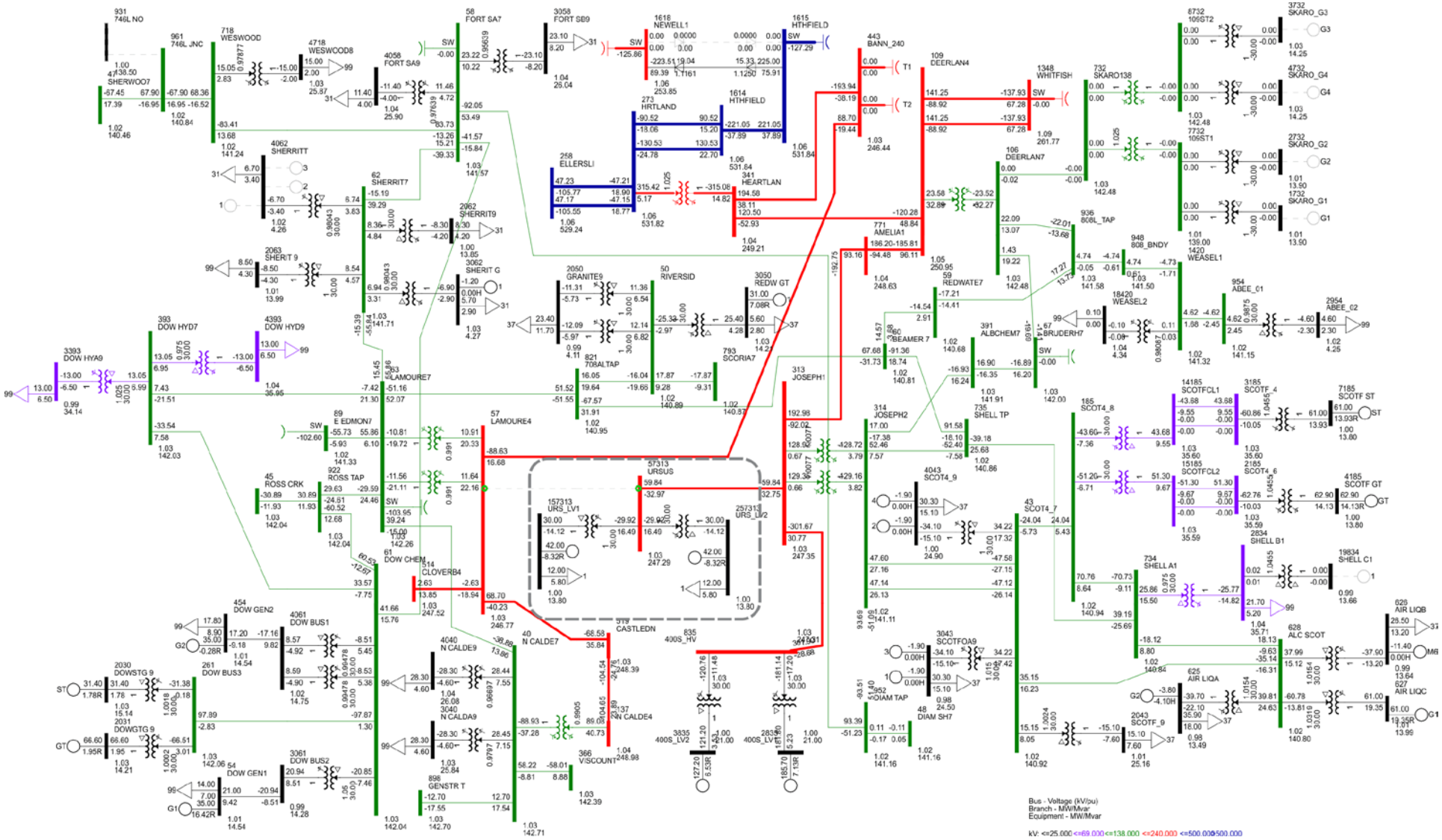


Figure A-21 : 2020SP Post-Project STS (P1421), Scenario 6a – Lamoureux 71S – Ursus 430S 997L out

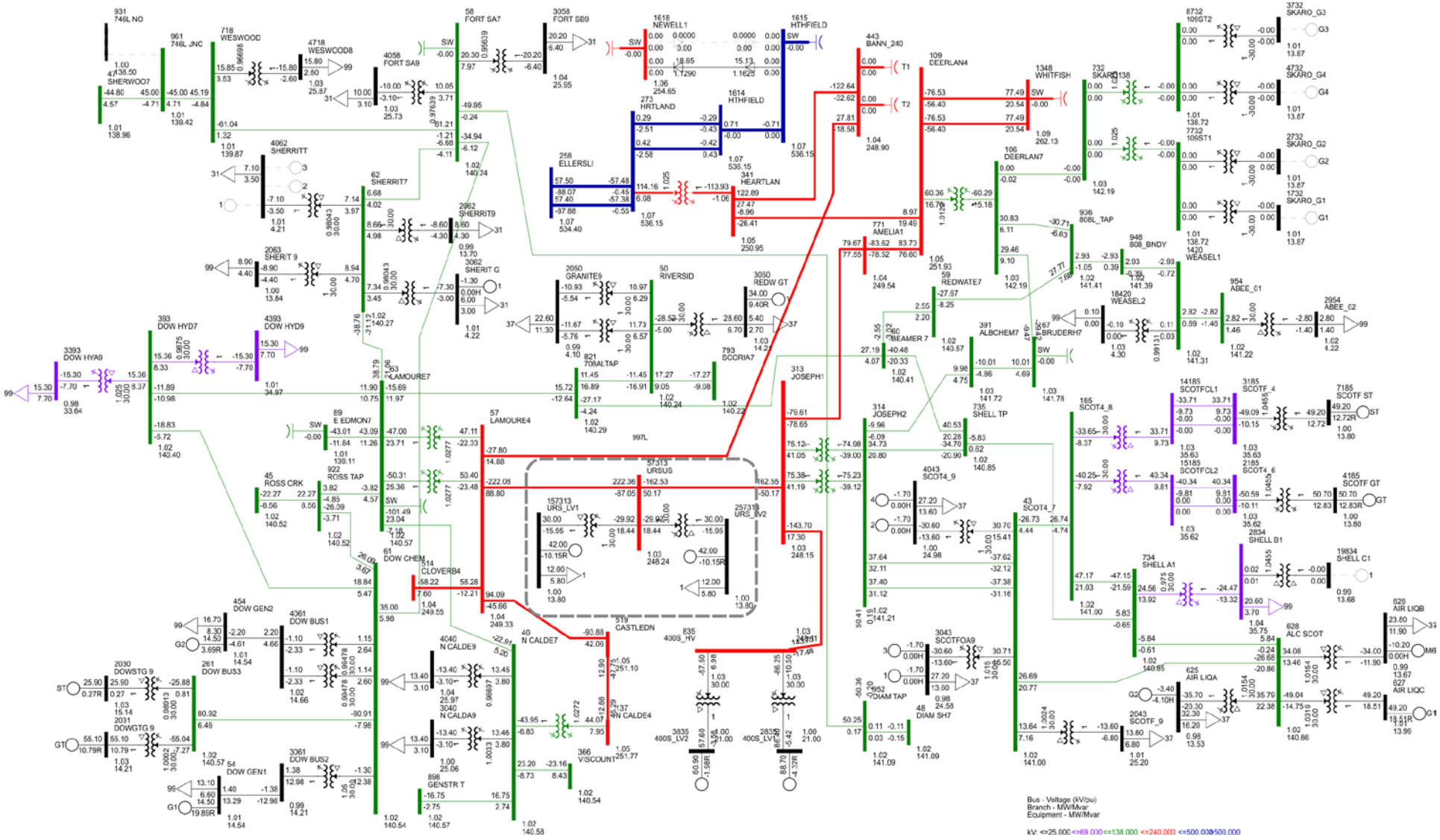


Figure A-22 : 2020SL Post-Project STS (P1421), Scenario 7a

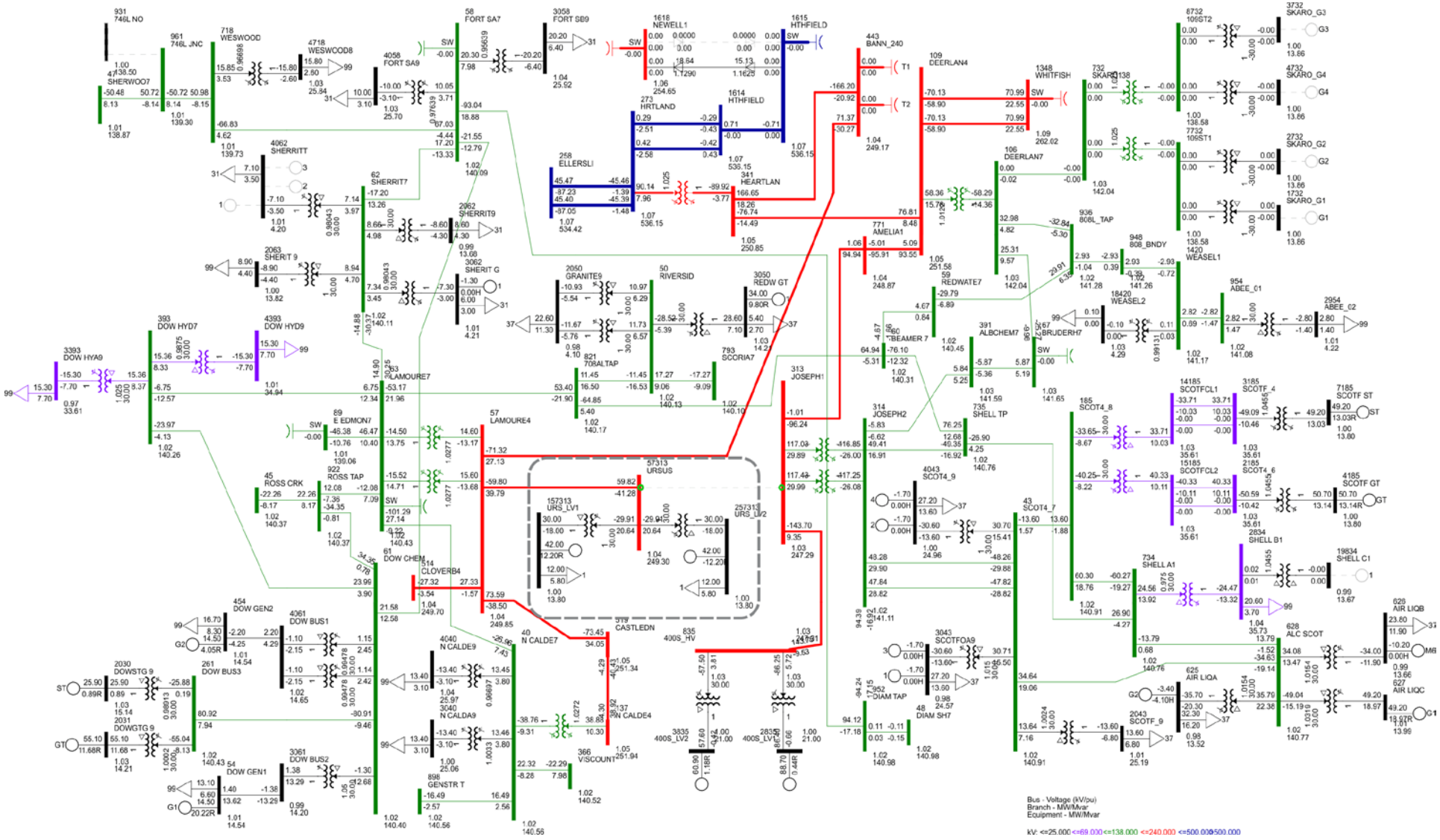


Figure A-23 : 2020SL Post-Project STS (P1421), Scenario 7a – Josephburg 410S – Ursus 430S 1027L out

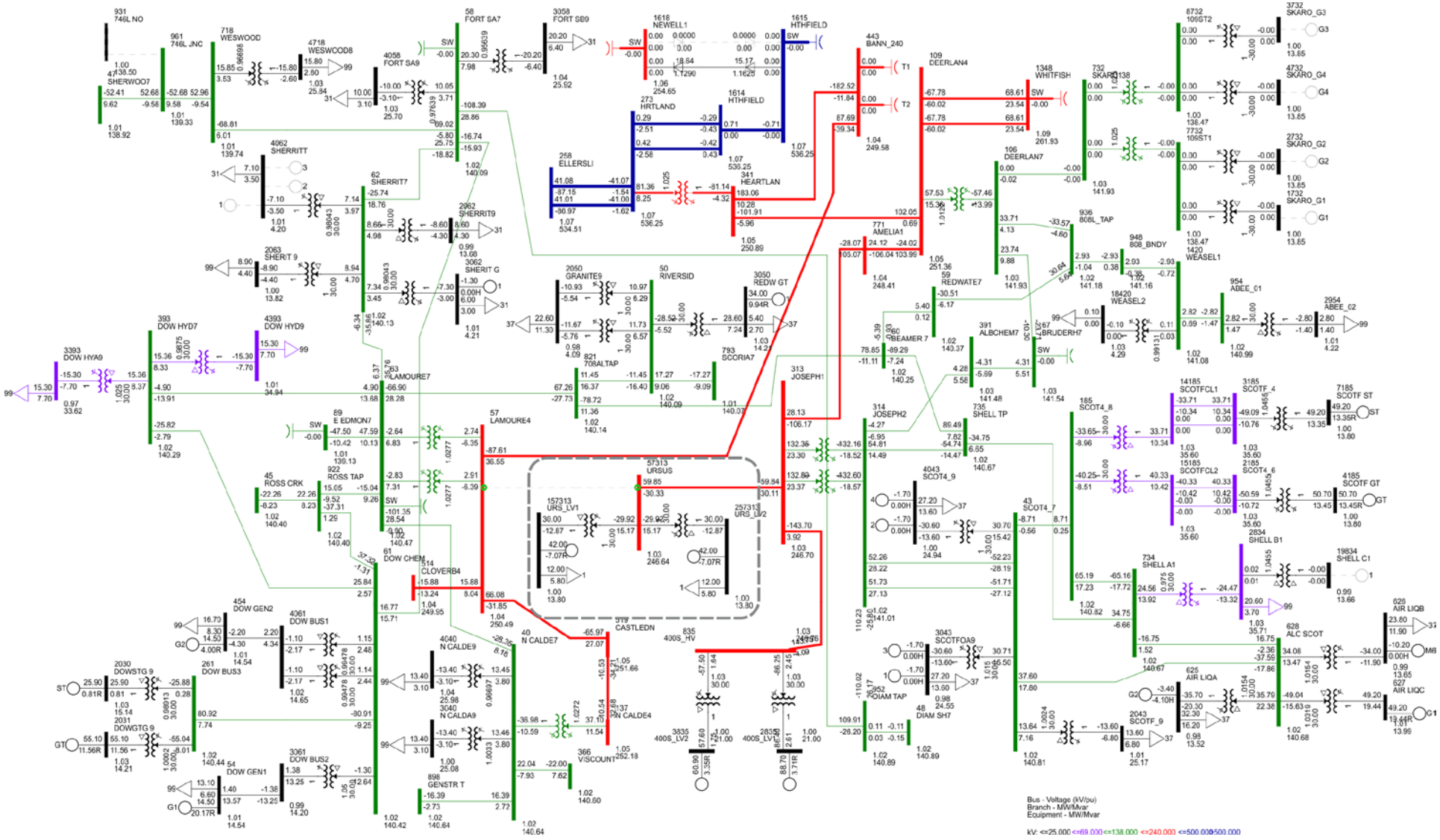


Figure A-24 : 2020SL Post-Project STS (P1421), Scenario 7a – Lamoureux 71S – Ursus 430S 997L out

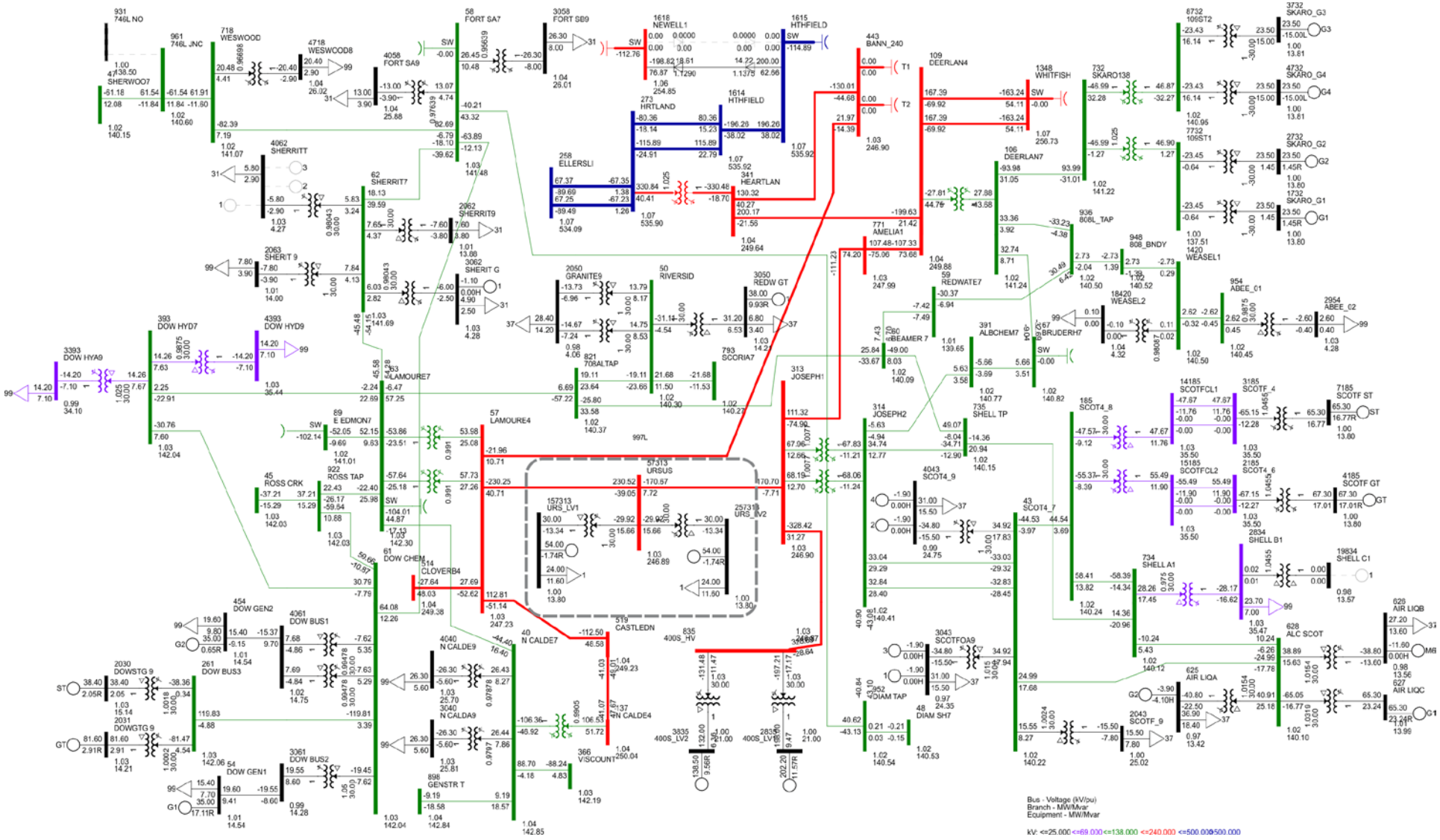


Figure A-25 : 2020WP Post-Project STS (P1421), Scenario 8a

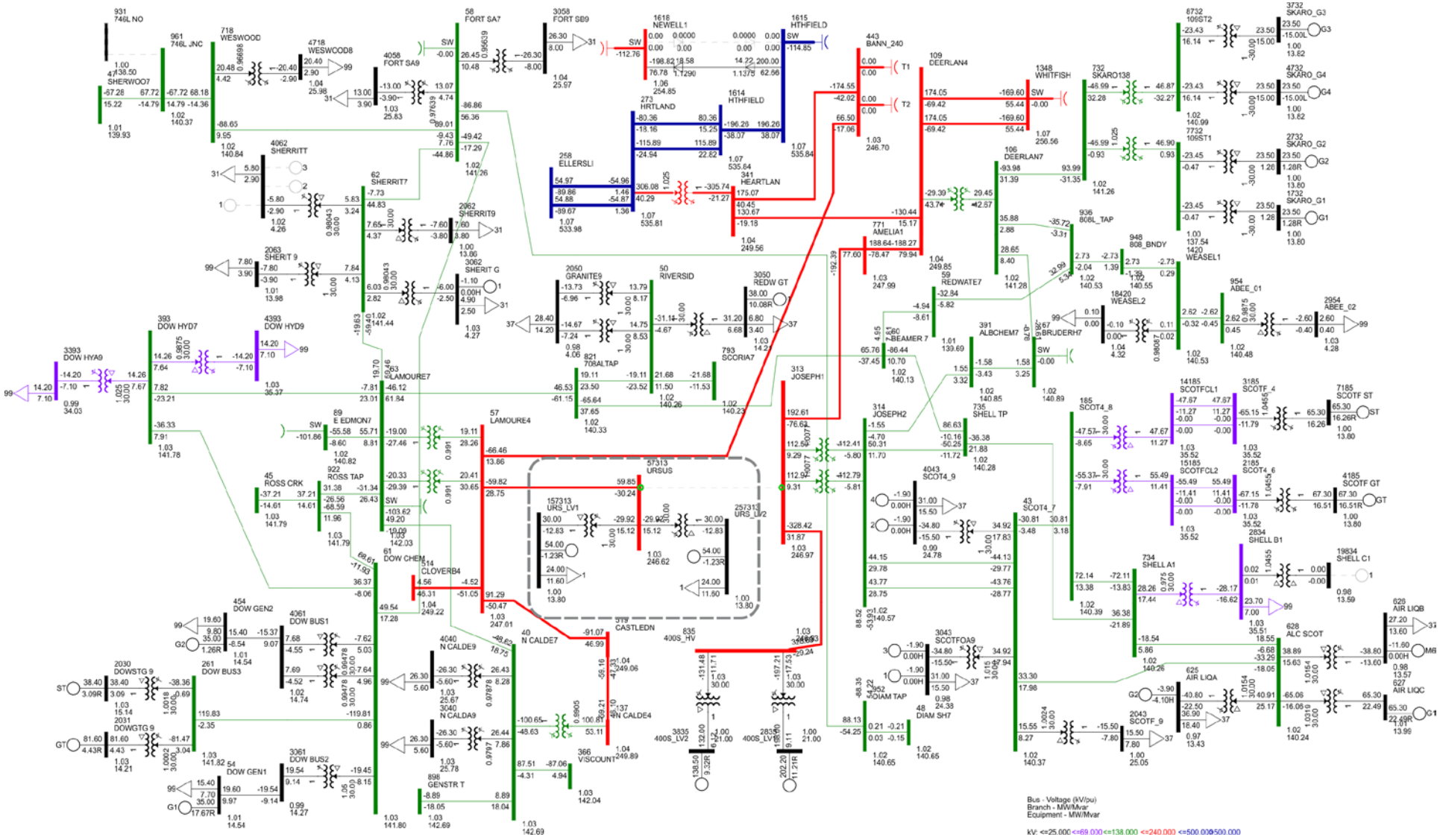


Figure A-26 : 2020WP Post-Project STS (P1421), Scenario 8a – Josephburg 410S – Ursus 430S 1027L out

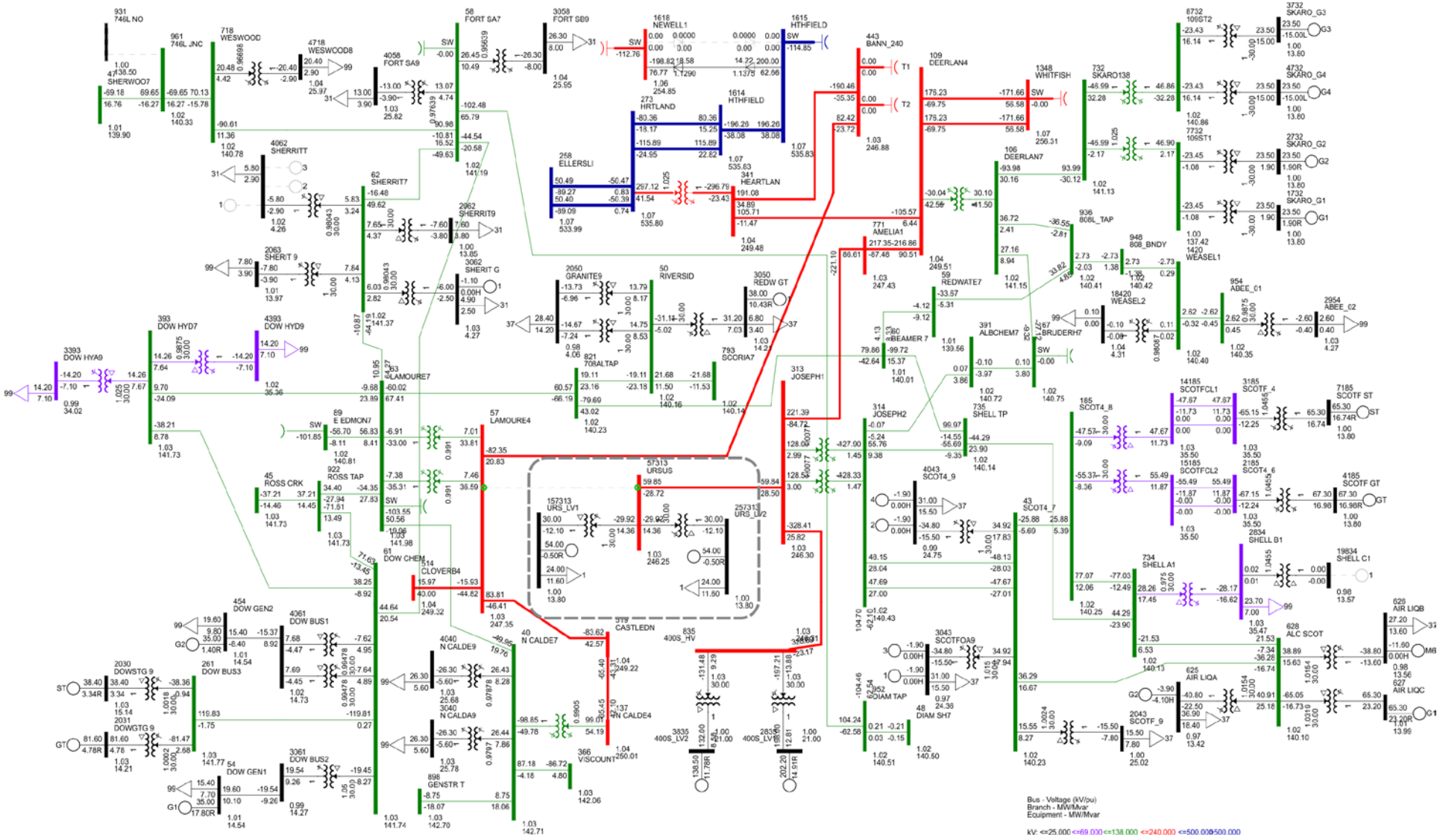


Figure A-27 : 2020WP Post-Project STS (P1421), Scenario 8a – Lamoureux 71S – Ursus 430S 997L out

Attachment A4
Post-Project Voltage Stability Diagrams

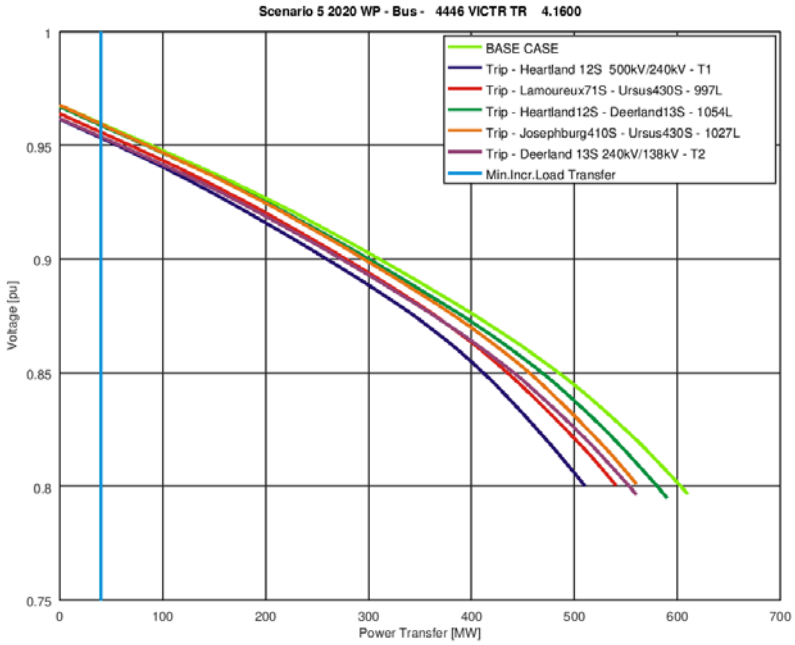


Figure A-28 Scenario 5 2020 WP - Bus - 4446 VICTR TR 4.1600

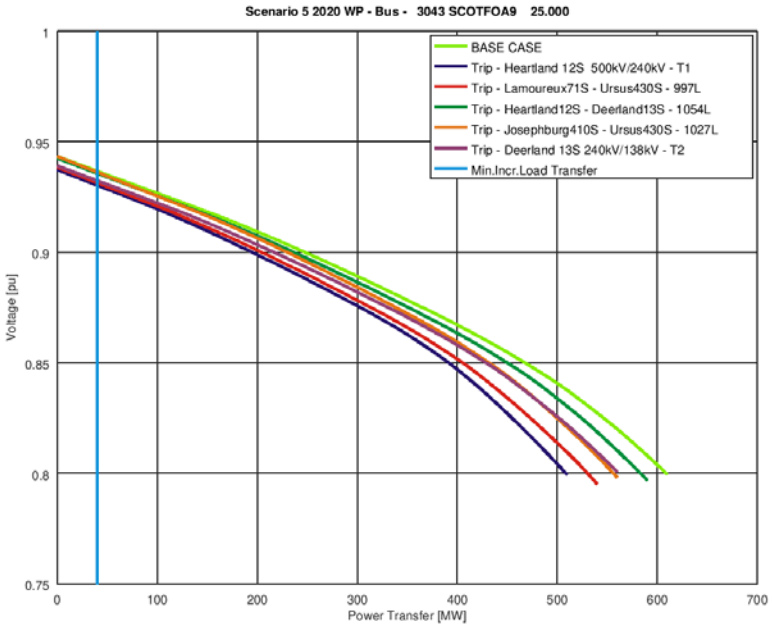


Figure A-29 Scenario 5 2020 WP - Bus - 3043 SCOTFOA9 25.000

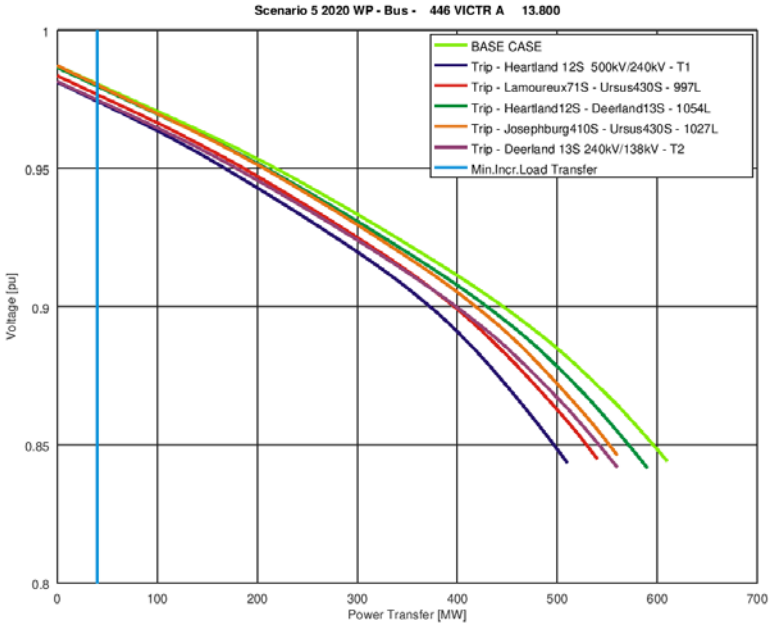


Figure A-30 Scenario 5 2020 WP - Bus - 446 VICTR A 13.800

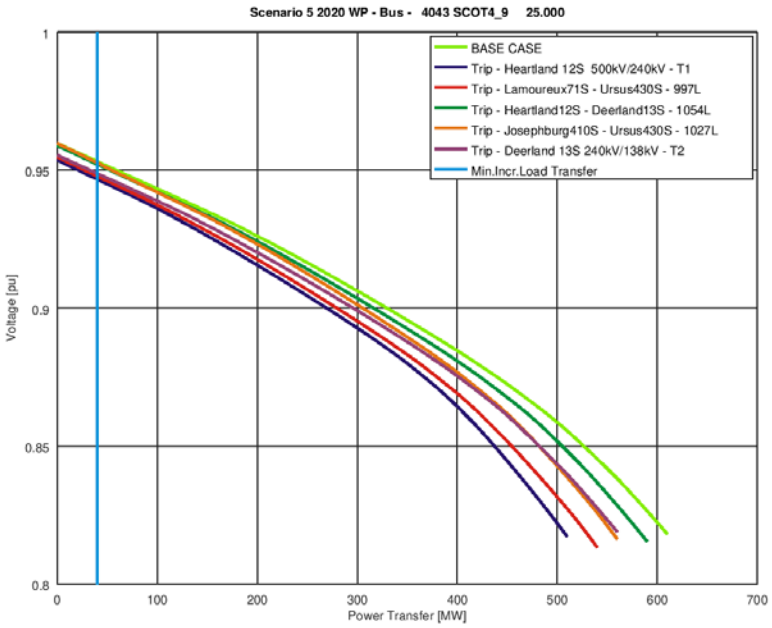


Figure A-31 Scenario 5 2020 WP - Bus - 4043 SCOT4_9 25.000

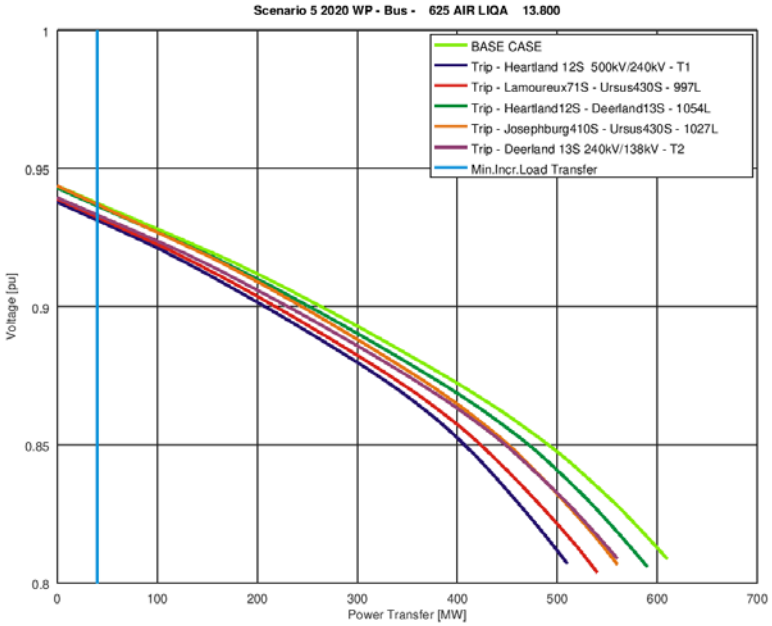


Figure A-32 Scenario 5 2020 WP - Bus - 625 AIR LIQA 13.800

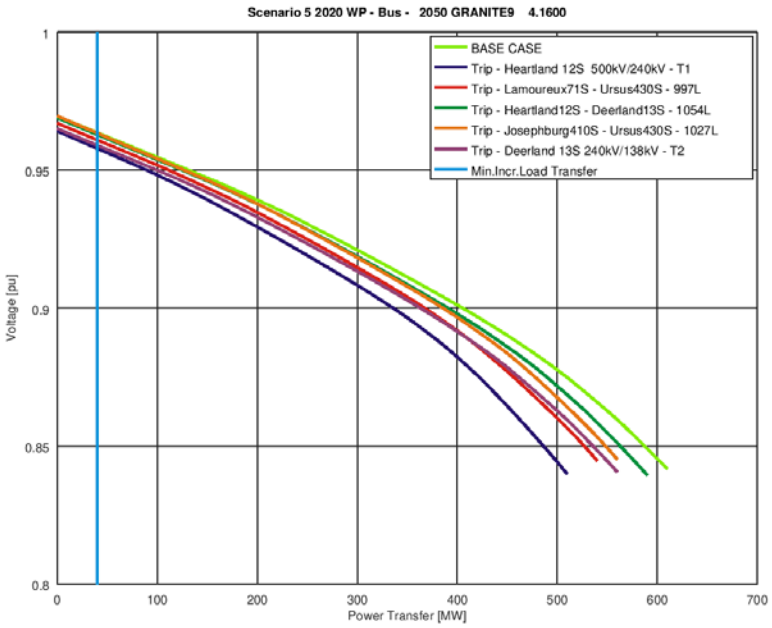


Figure A-33 Scenario 5 2020 WP - Bus - 2050 GRANITE9 4.1600

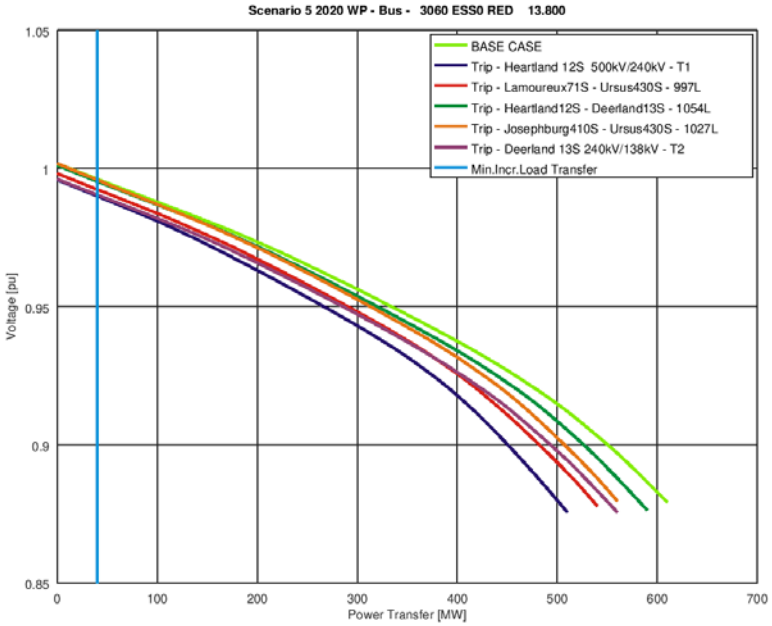


Figure A-34 Scenario 5 2020 WP - Bus - 3060 ESS0 RED 13.800

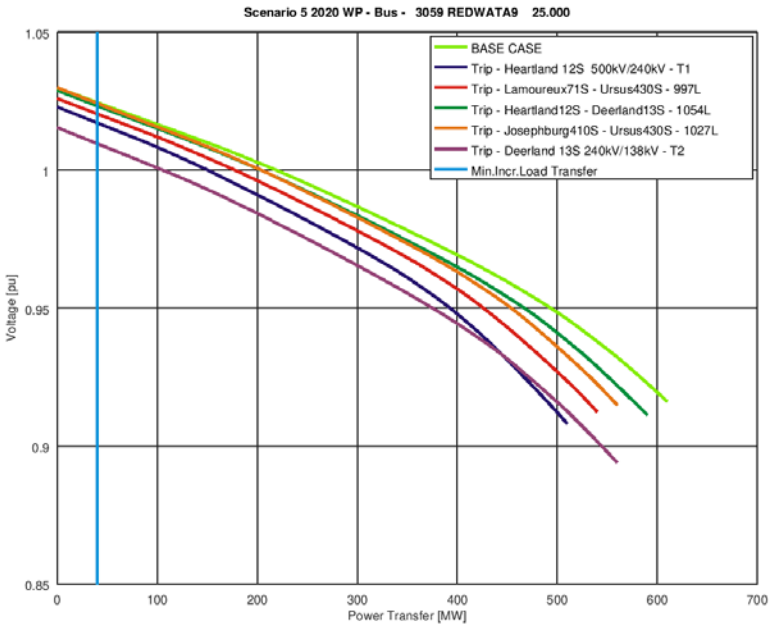


Figure A-35 Scenario 5 2020 WP - Bus - 3059 REDWATA9 25.000

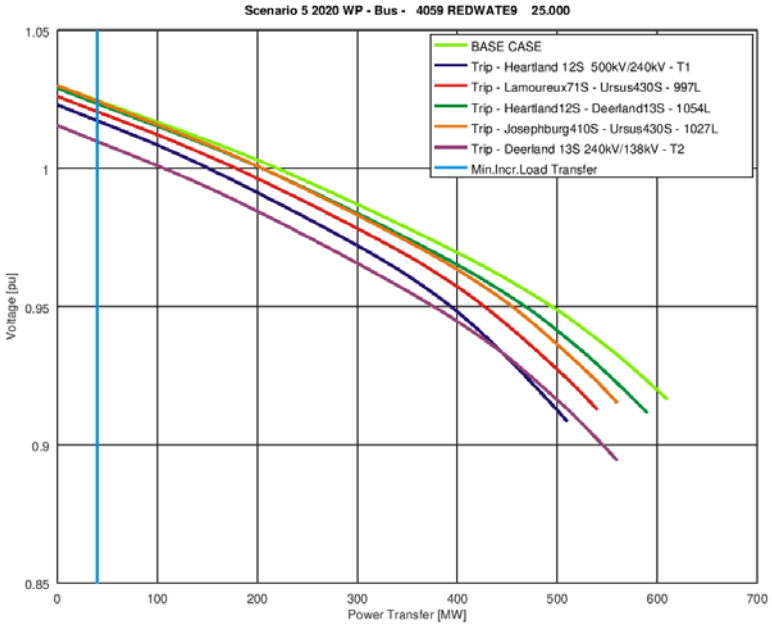


Figure A-36 Scenario 5 2020 WP - Bus - 4059 REDWATE9 25.000

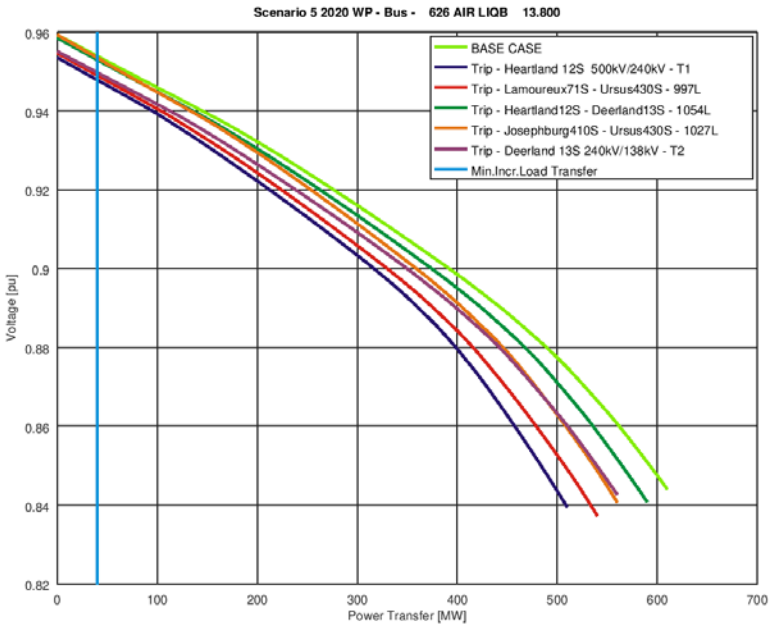


Figure A-37 Scenario 5 2020 WP - Bus - 626 AIR LIQB 13.800

Attachment A5
Post-Project Transient Stability Diagrams

Ten (10) seconds of flat run was used before applying the disturbance. Three phase (3P) fault and line to ground (LG) fault were plotted. The reclose of the line was not simulated.

Angle, Power, Vars plots for the generating units online were plotted.

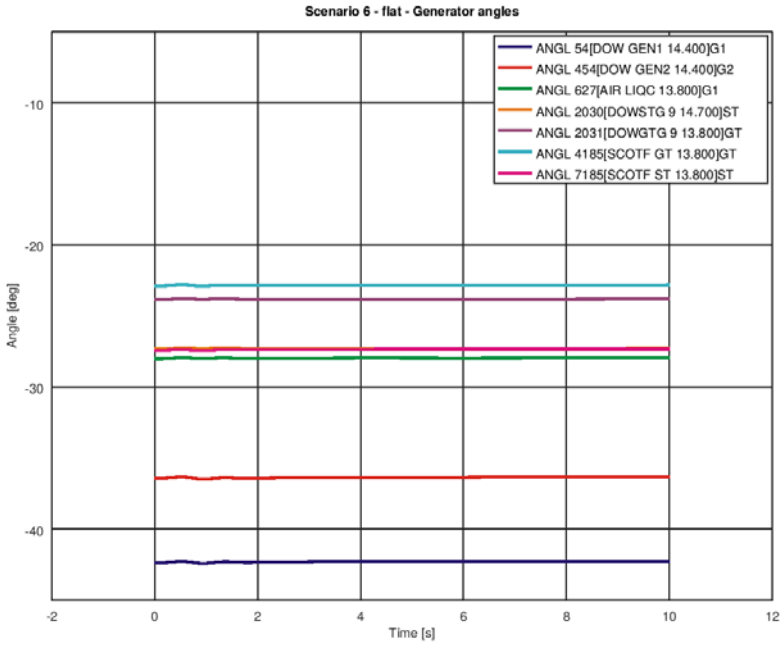


Figure A-38 Scenario 6 - flat - Generator angles

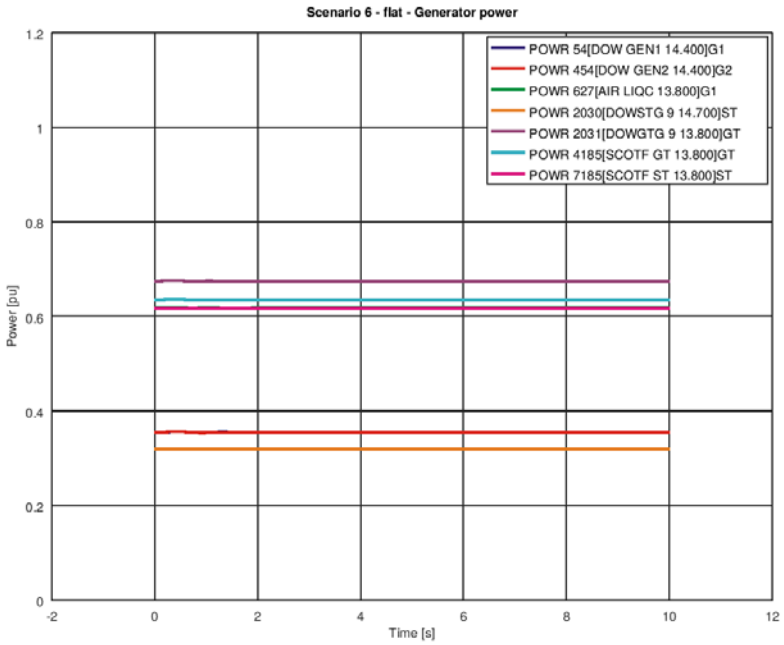


Figure A-39 Scenario 6 - flat - Generator power

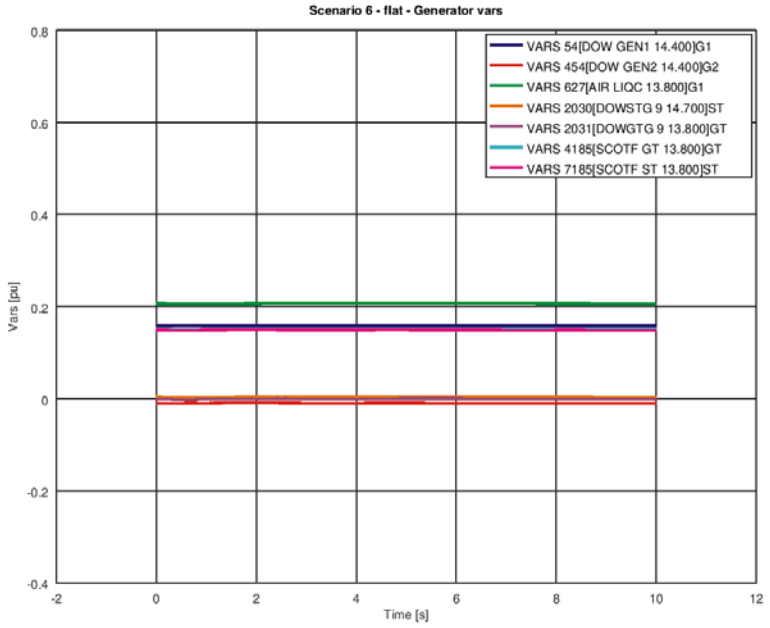


Figure A-40 Scenario 6 - flat - Generator vars

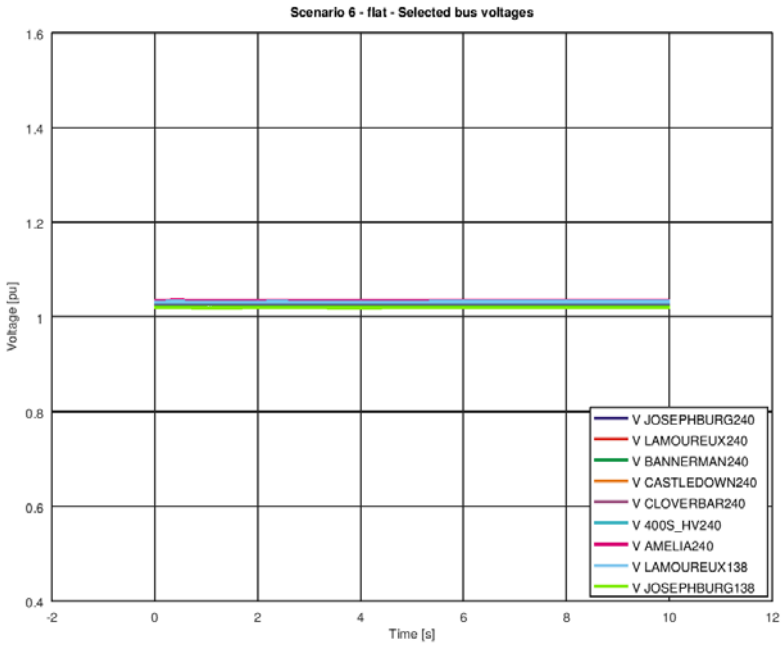


Figure A-41 Scenario 6 - flat - Selected bus voltages

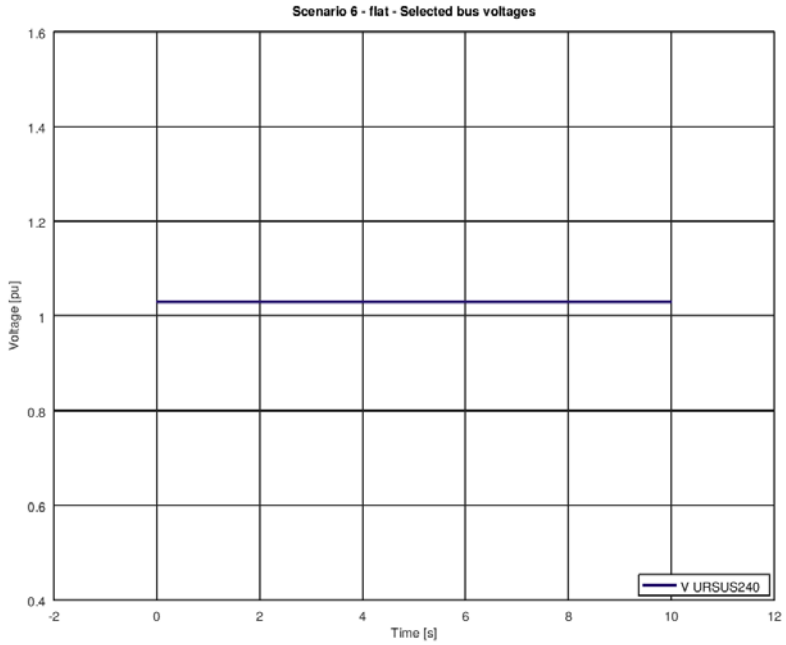


Figure A-42 Scenario 6 - flat - Selected bus voltages

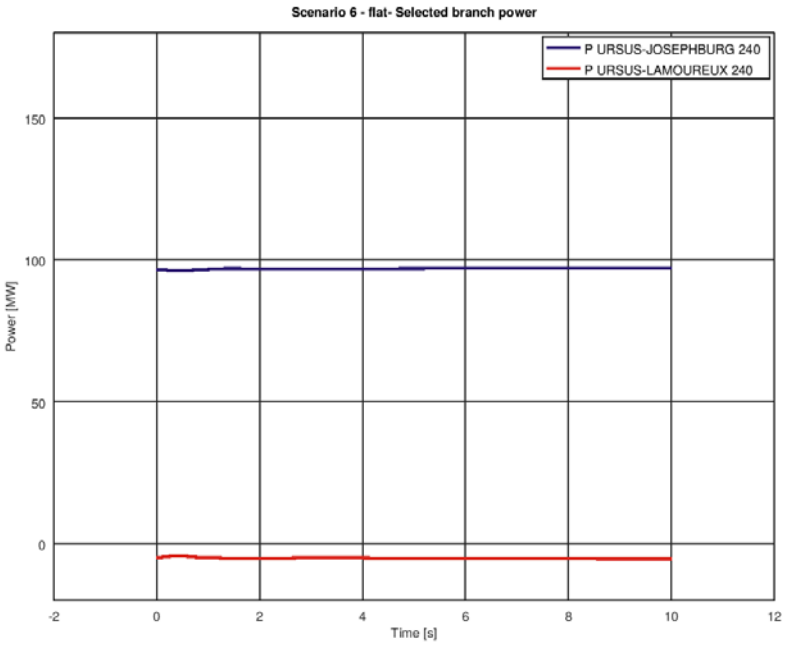


Figure A-43 Scenario 6 - flat - Selected branch power

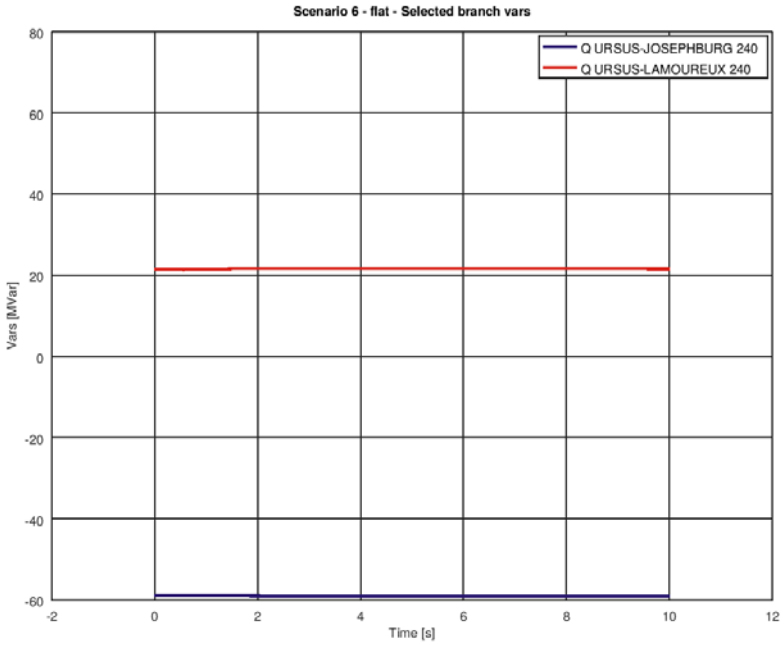


Figure A-44 Scenario 6 - flat - Selected branch vars

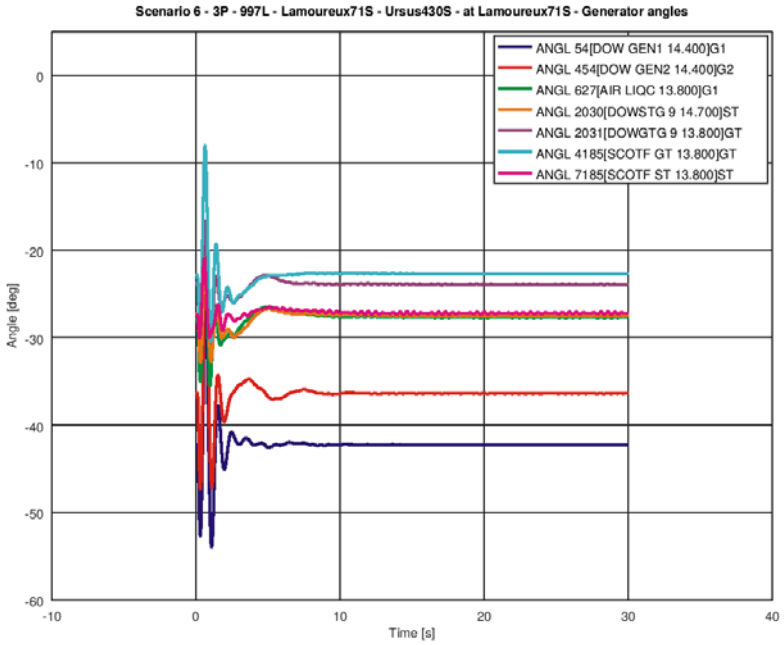


Figure A-45 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

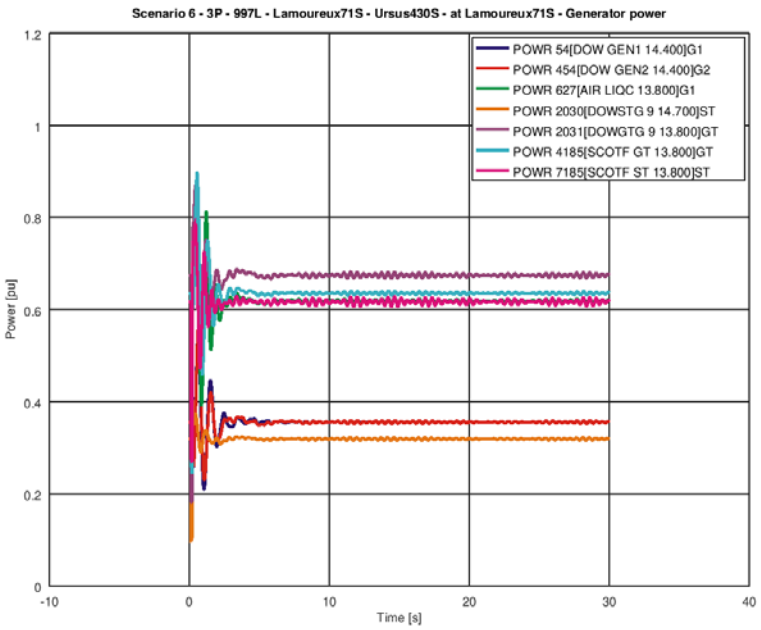


Figure A-46 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

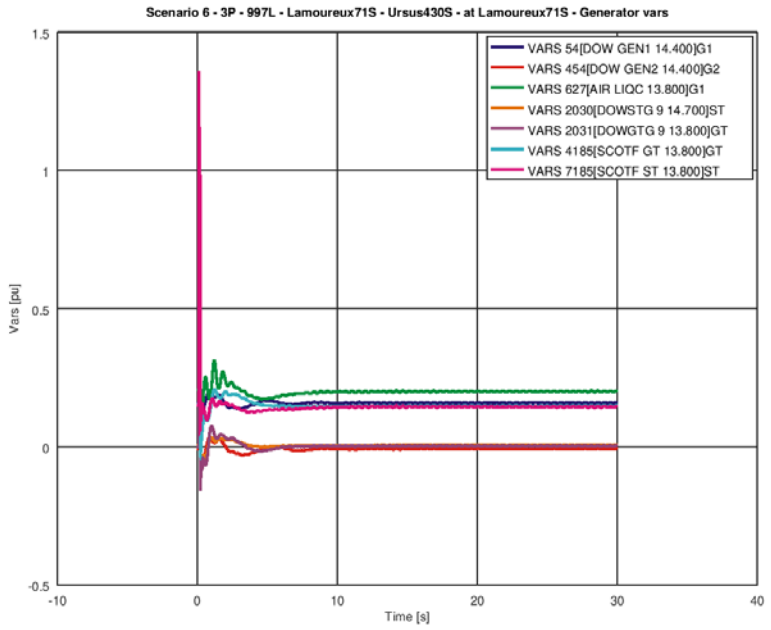


Figure A-47 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

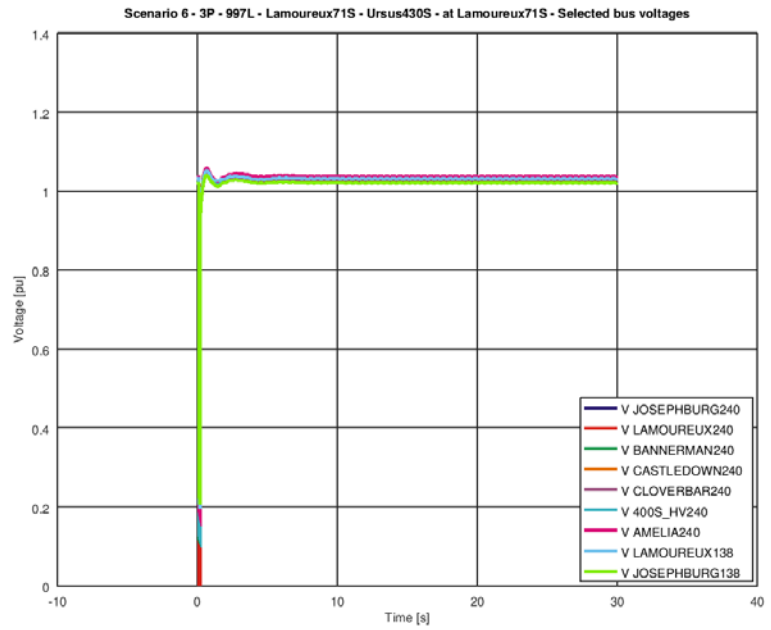


Figure A-48 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

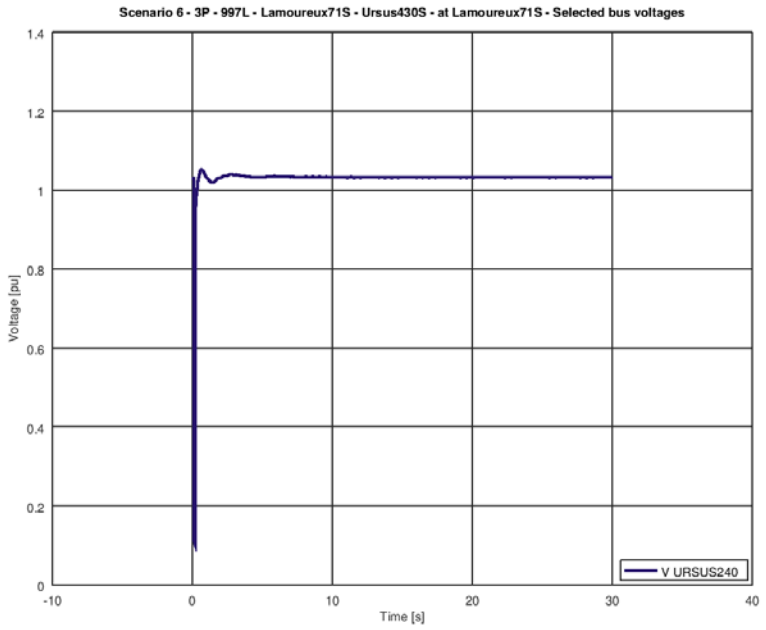


Figure A-49 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

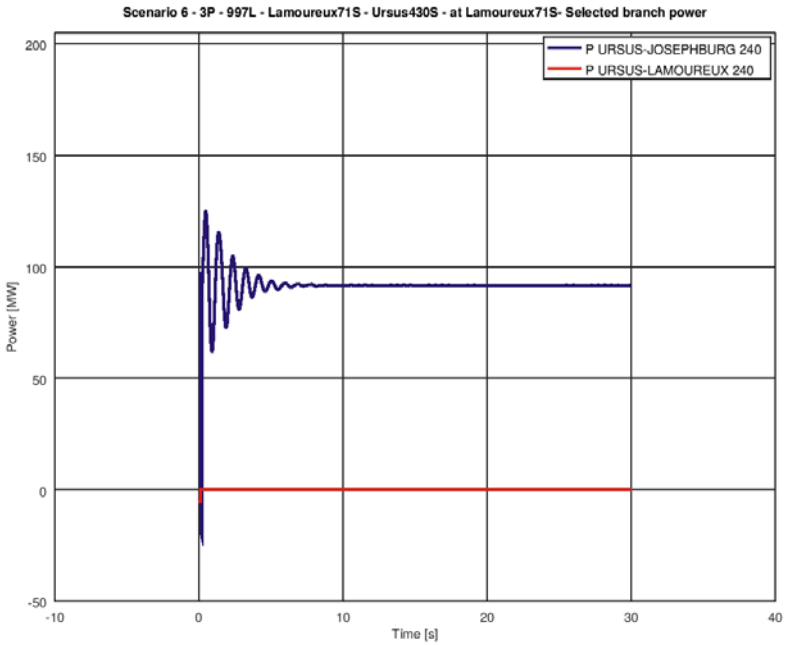


Figure A-50 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

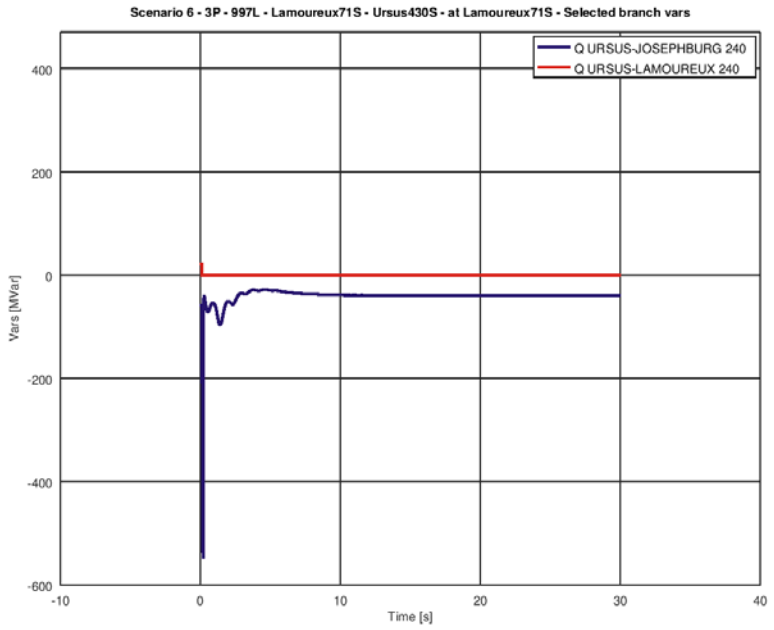


Figure A-51 Scenario 6 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

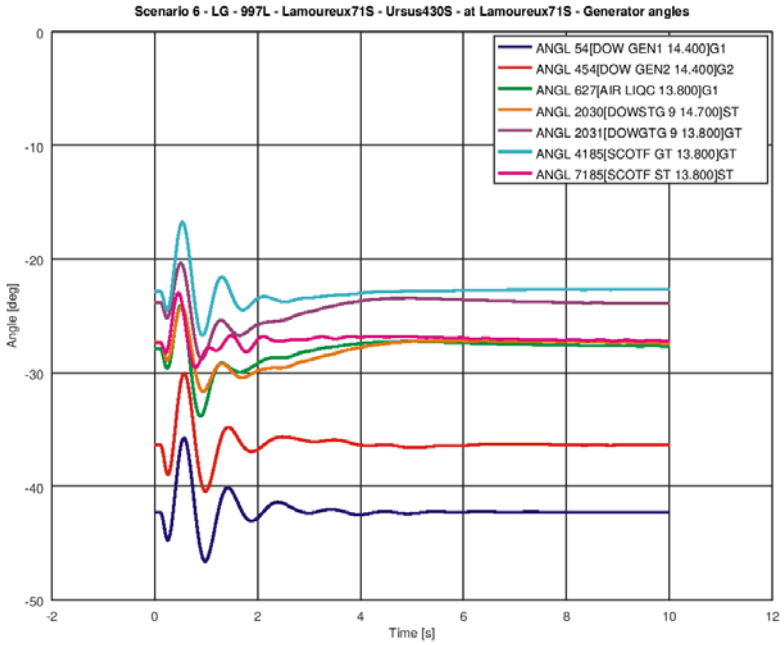


Figure A-52 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

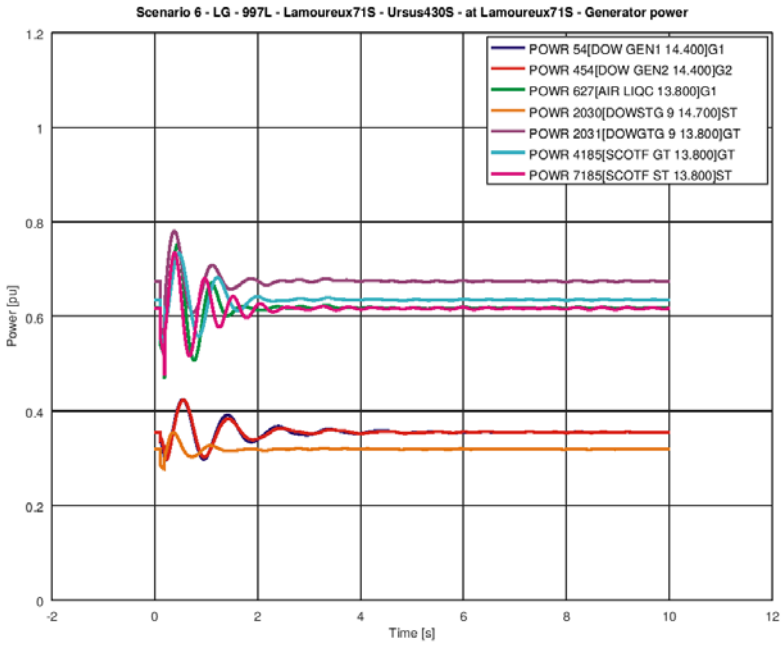


Figure A-53 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

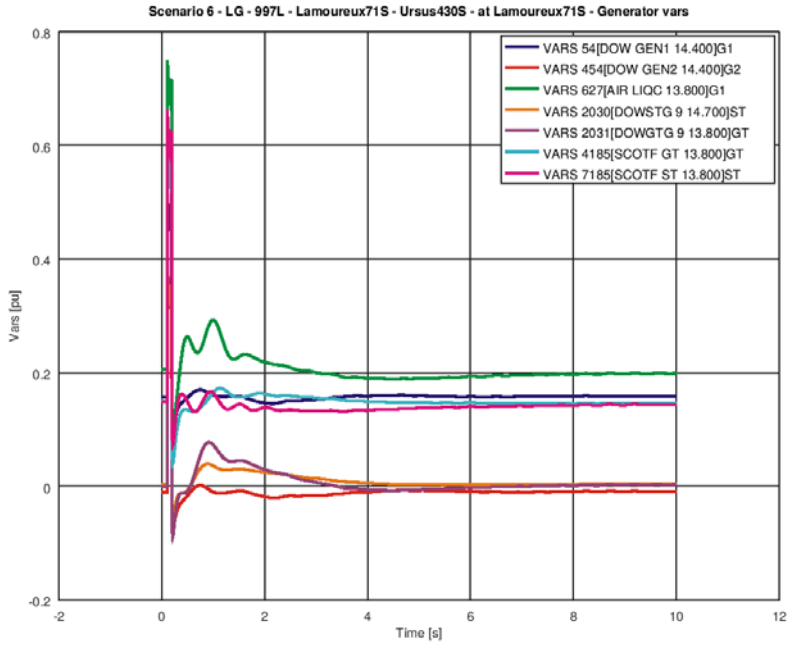


Figure A-54 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

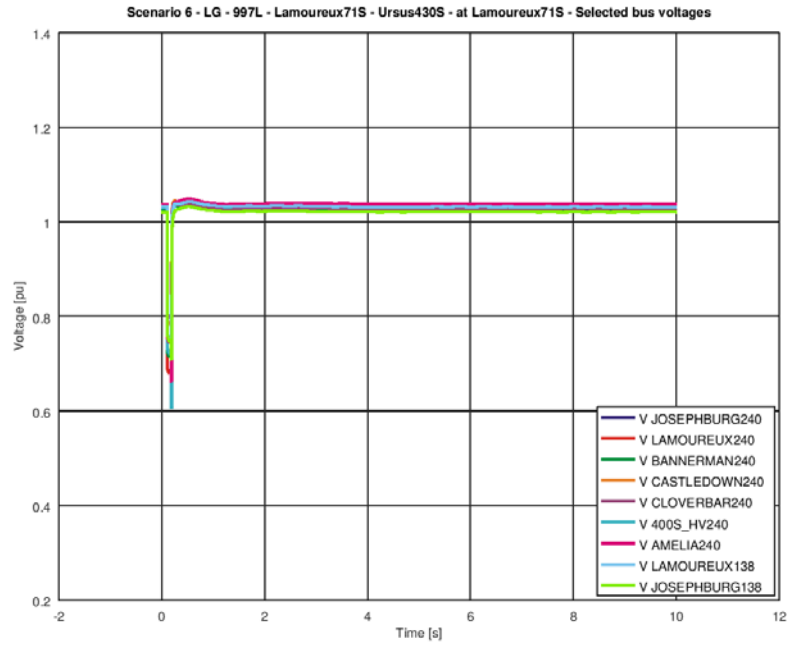


Figure A-55 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

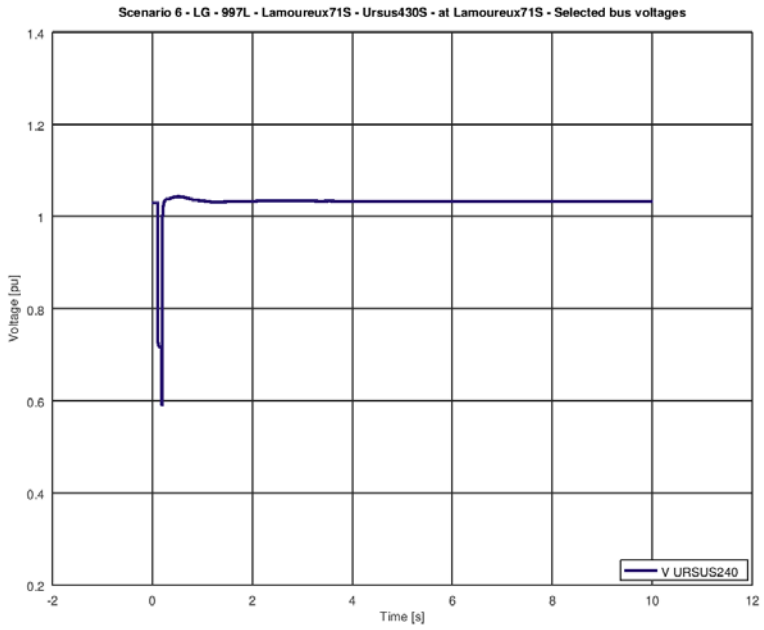


Figure A-56 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

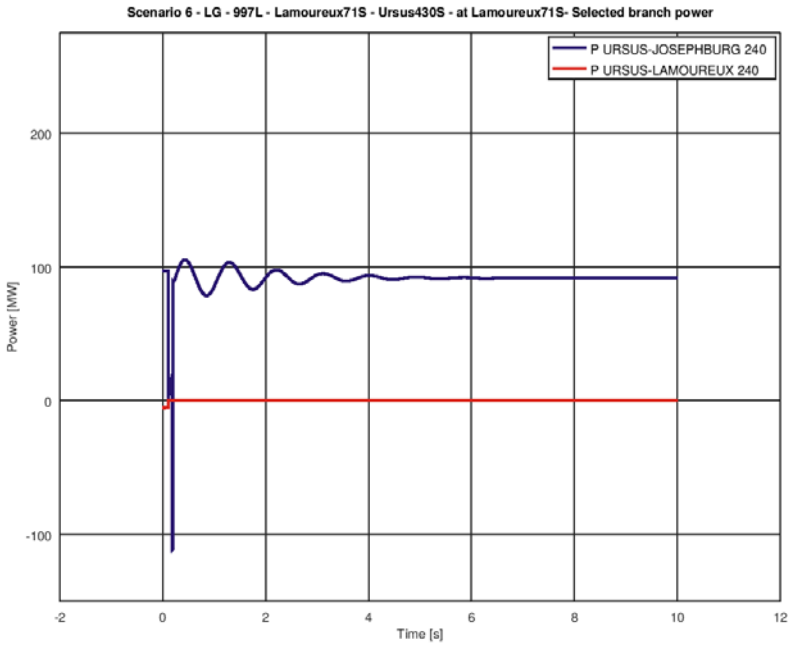


Figure A-57 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

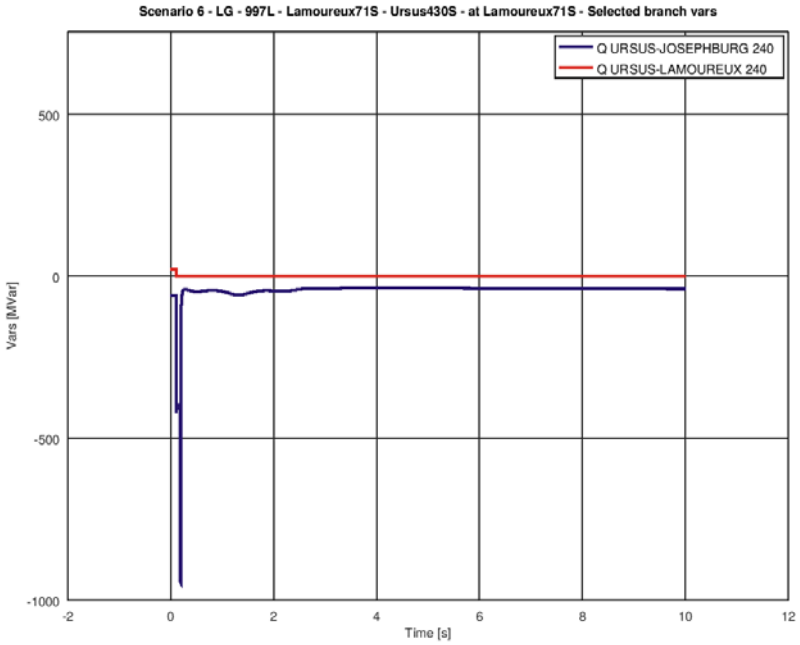


Figure A-58 Scenario 6 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

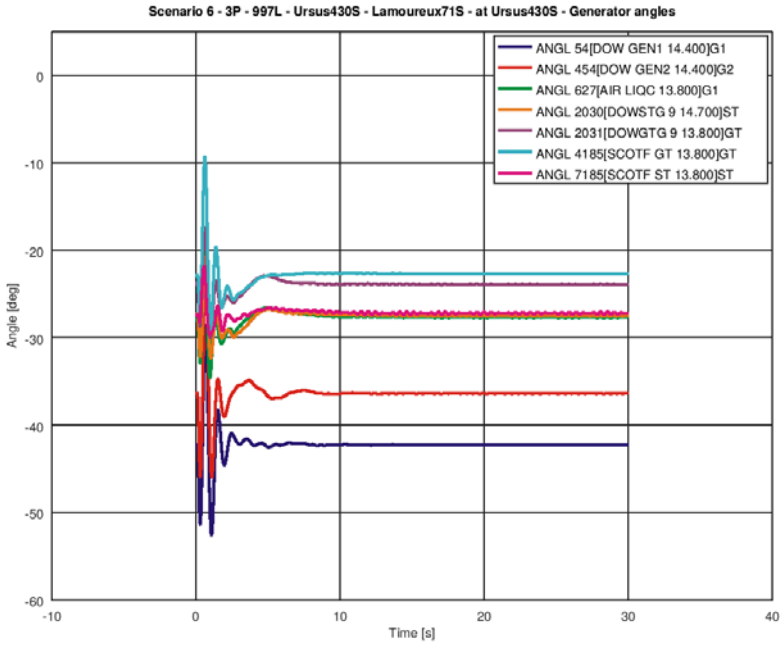


Figure A-59 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

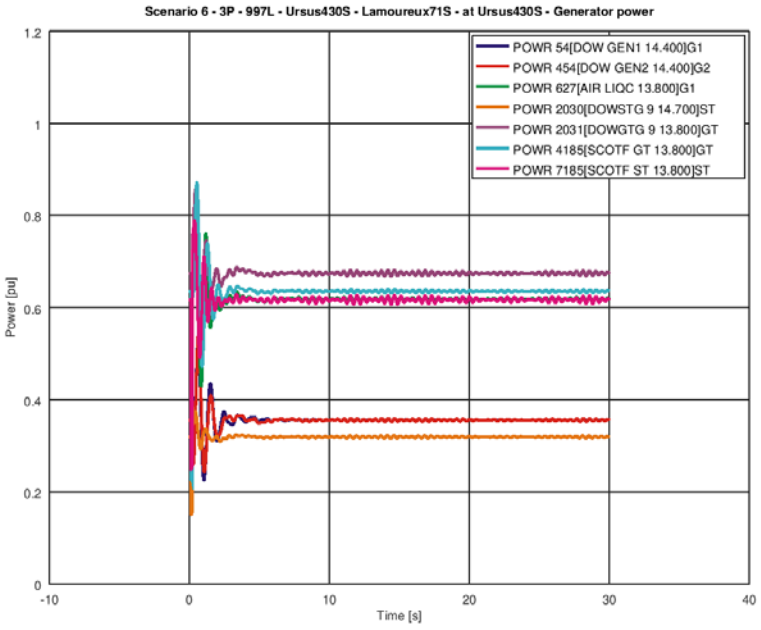


Figure A-60 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

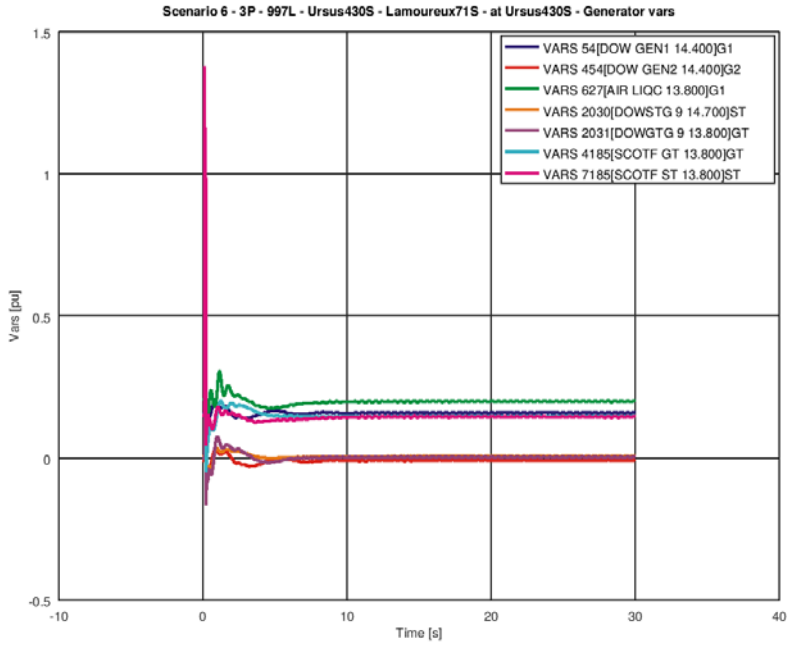


Figure A-61 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

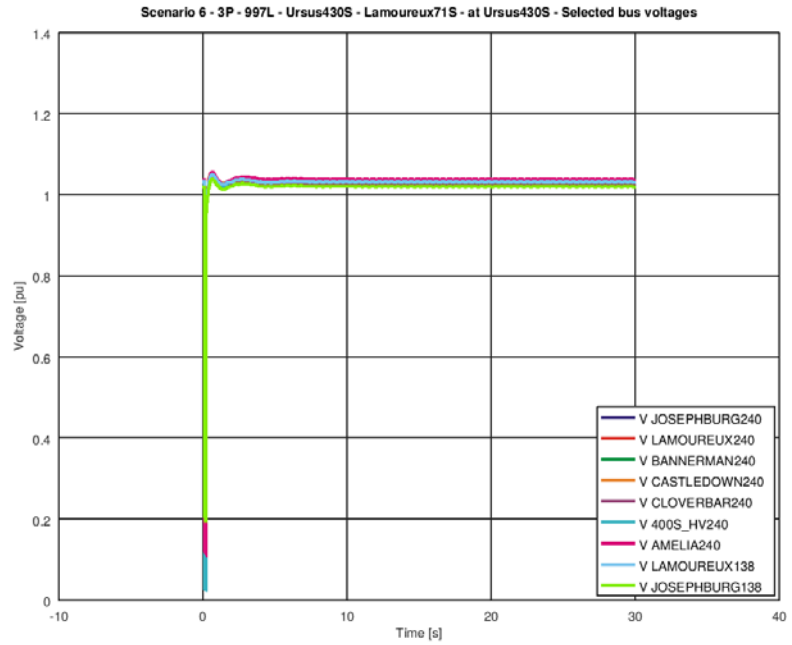


Figure A-62 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

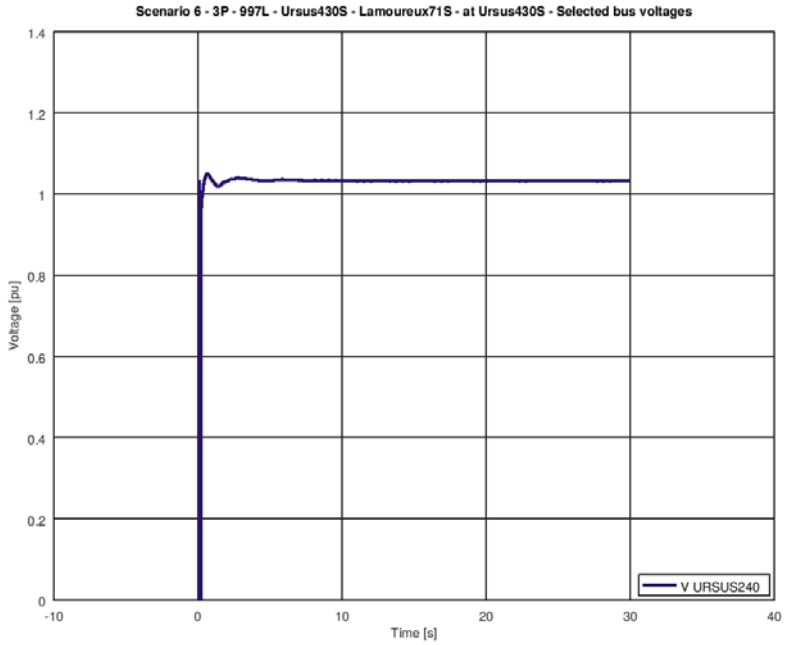


Figure A-63 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

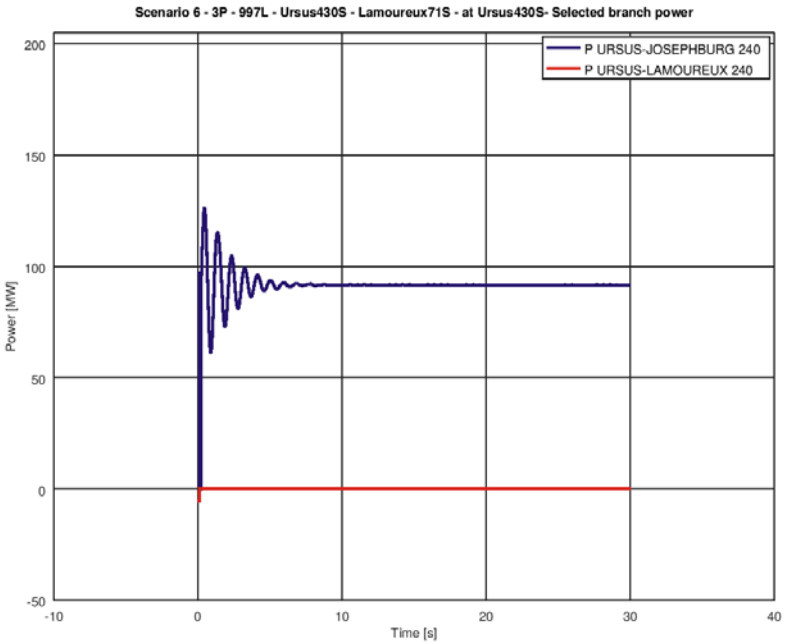


Figure A-64 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

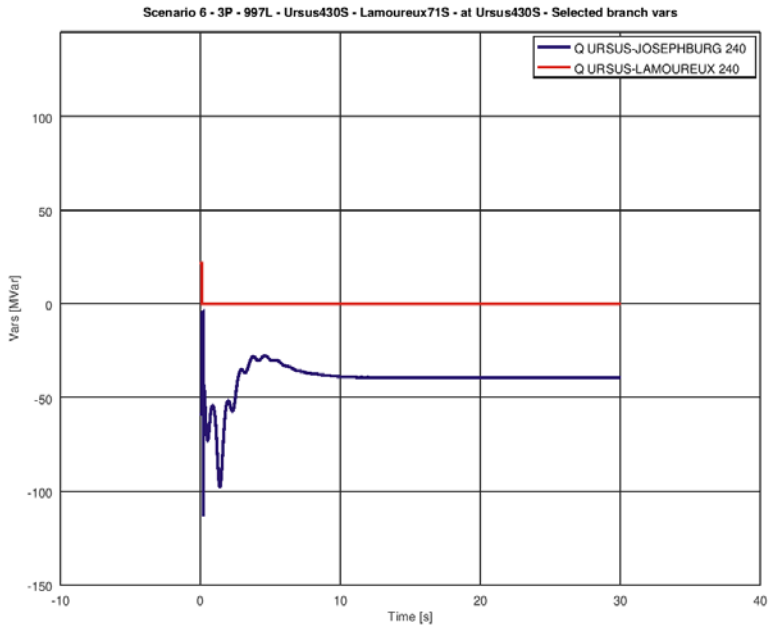


Figure A-65 Scenario 6 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

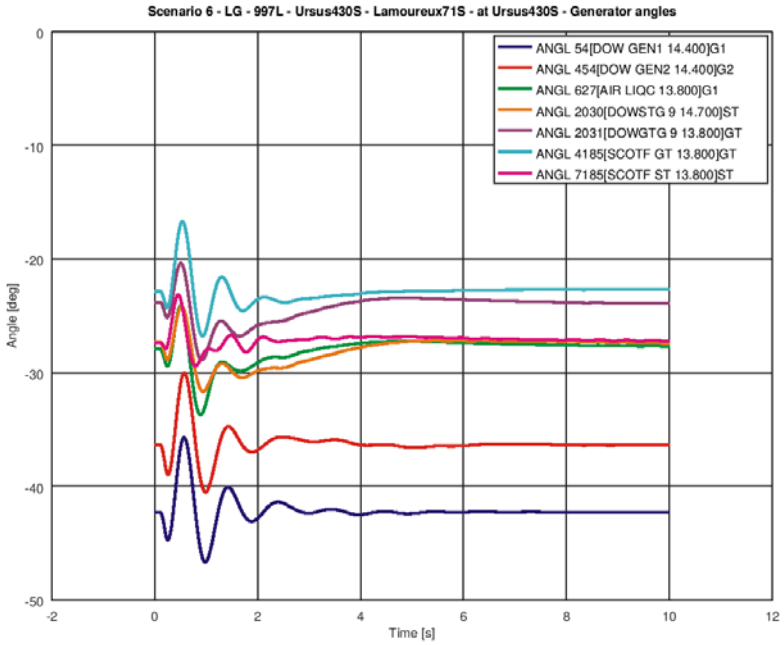


Figure A-66 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

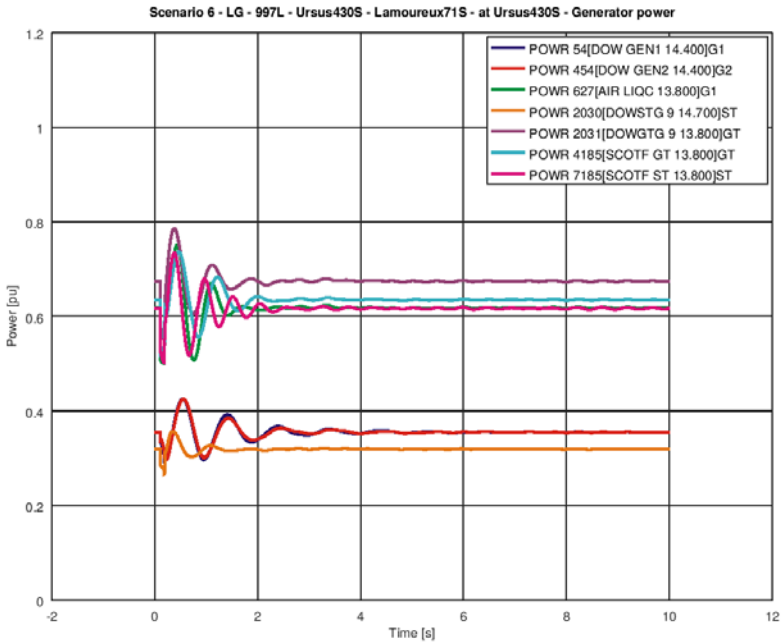


Figure A-67 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

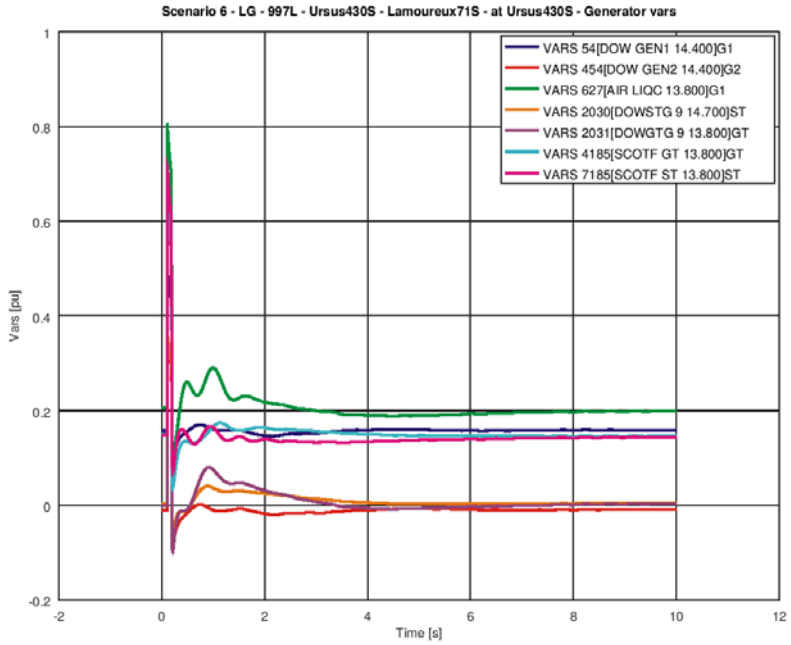


Figure A-68 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

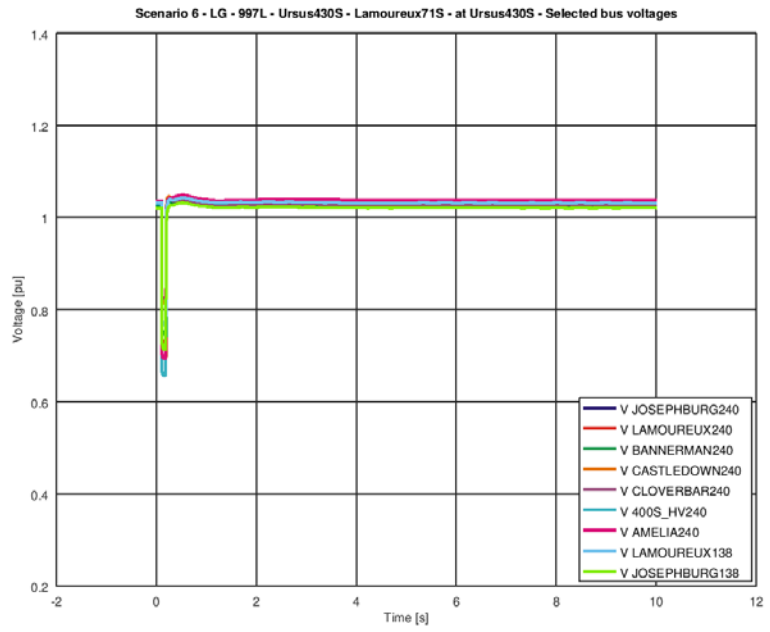


Figure A-69 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

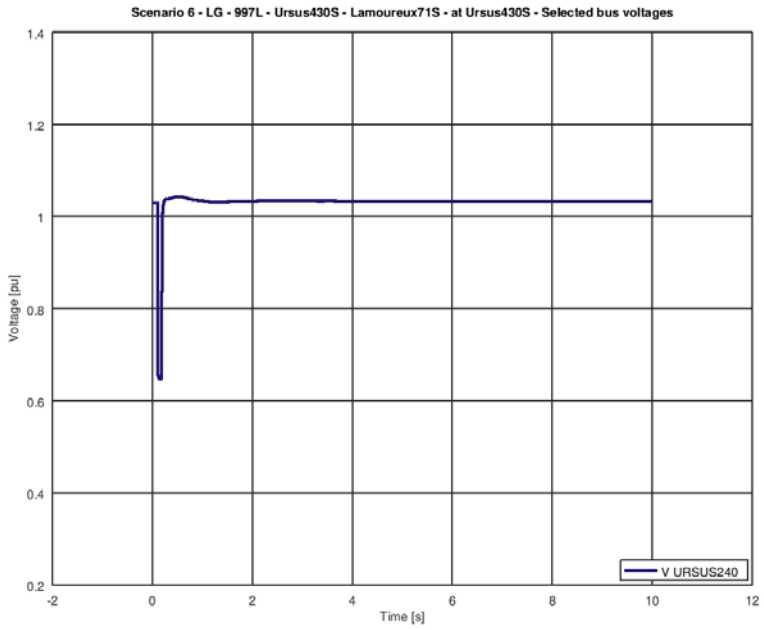


Figure A-70 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

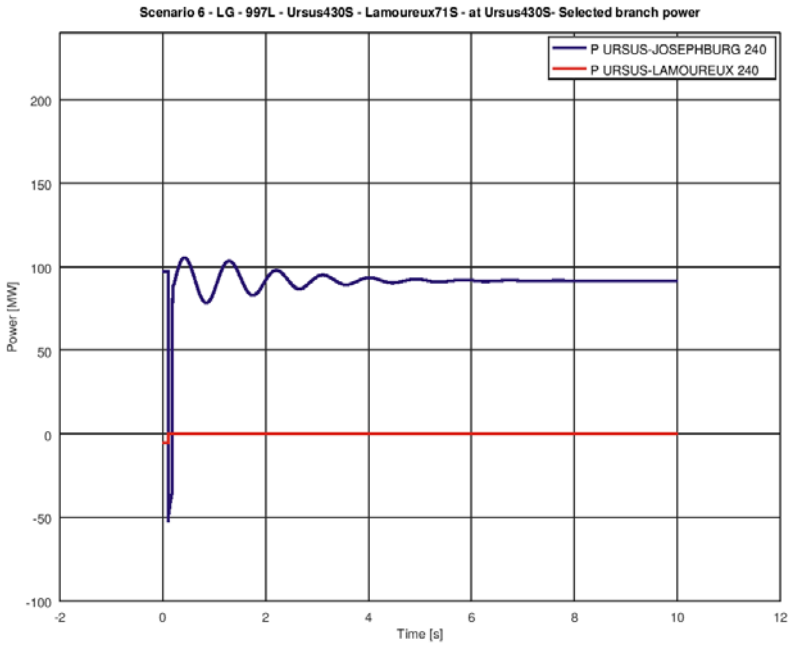


Figure A-71 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

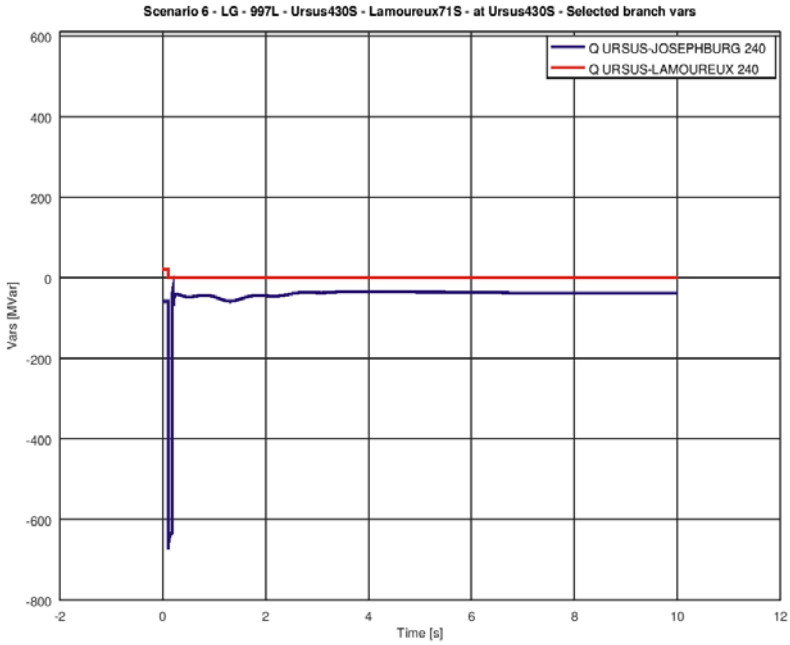


Figure A-72 Scenario 6 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

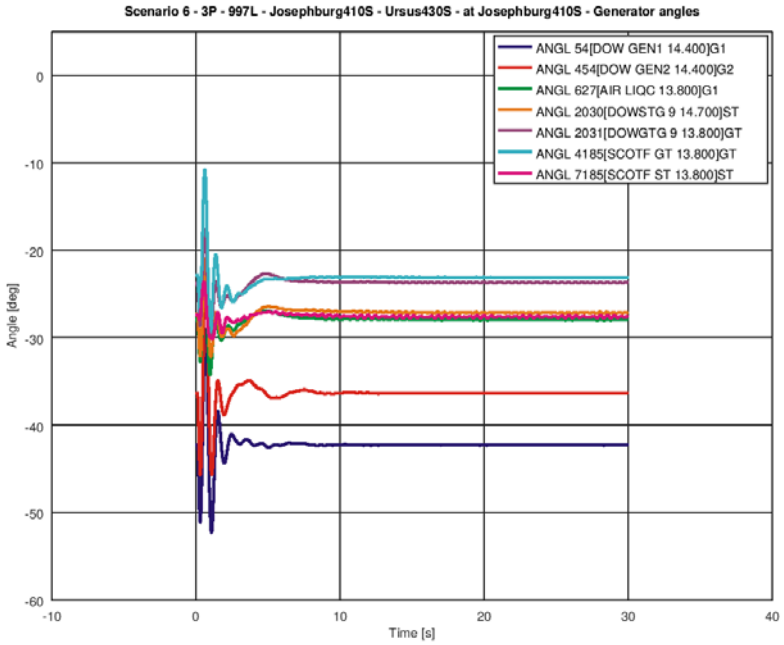


Figure A-73 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

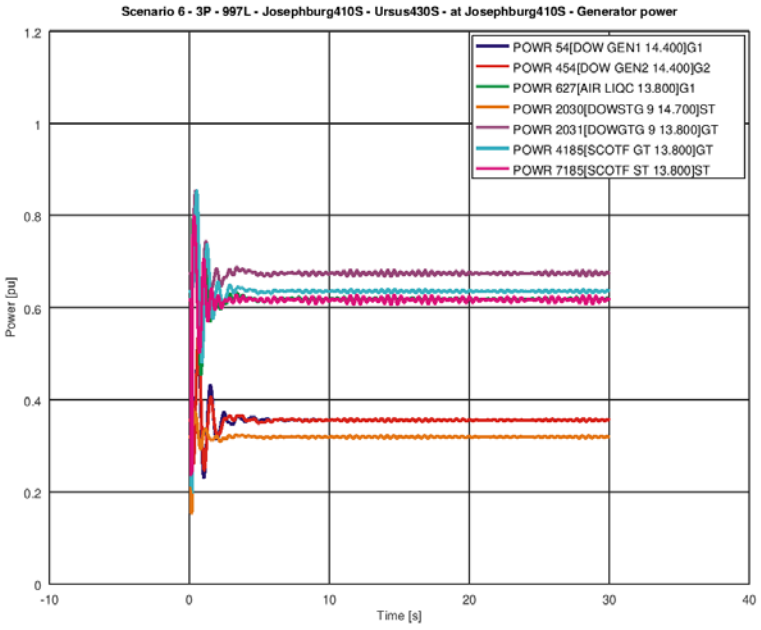


Figure A-74 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

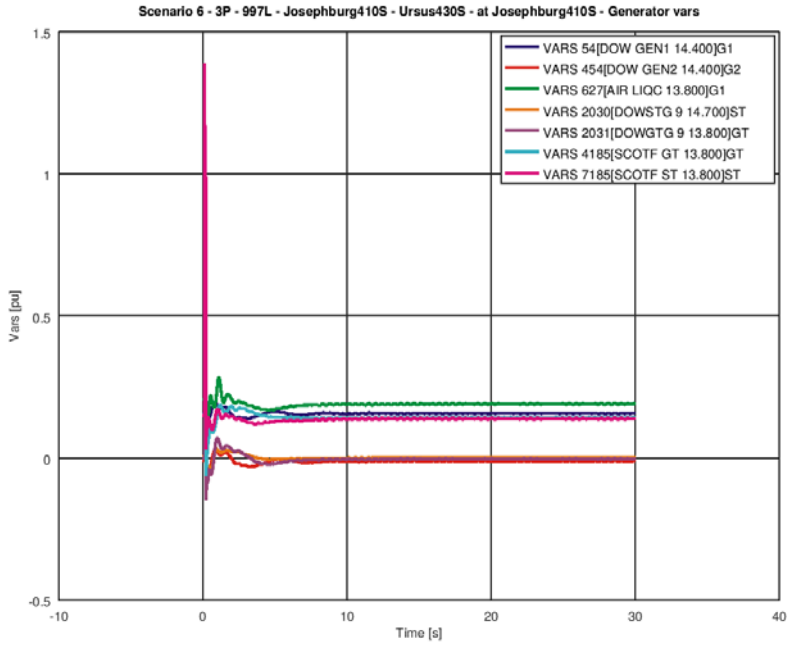


Figure A-75 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

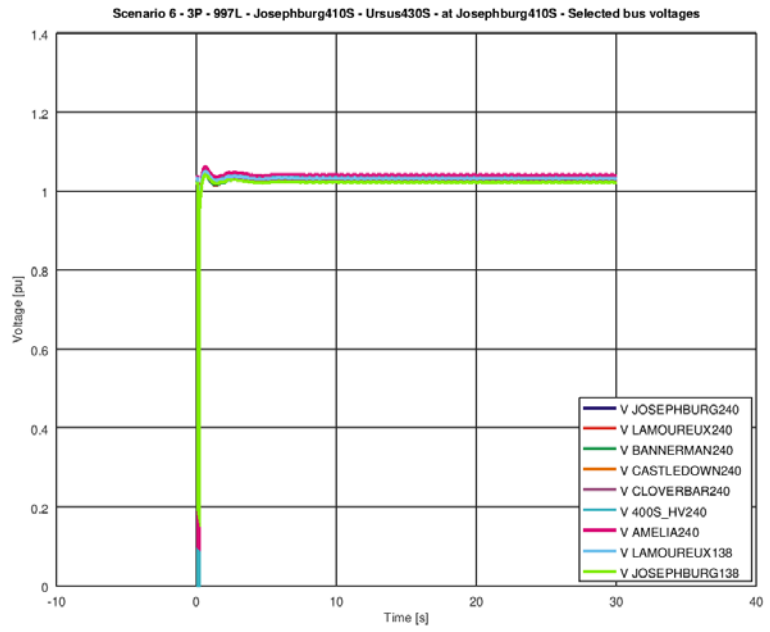


Figure A-76 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

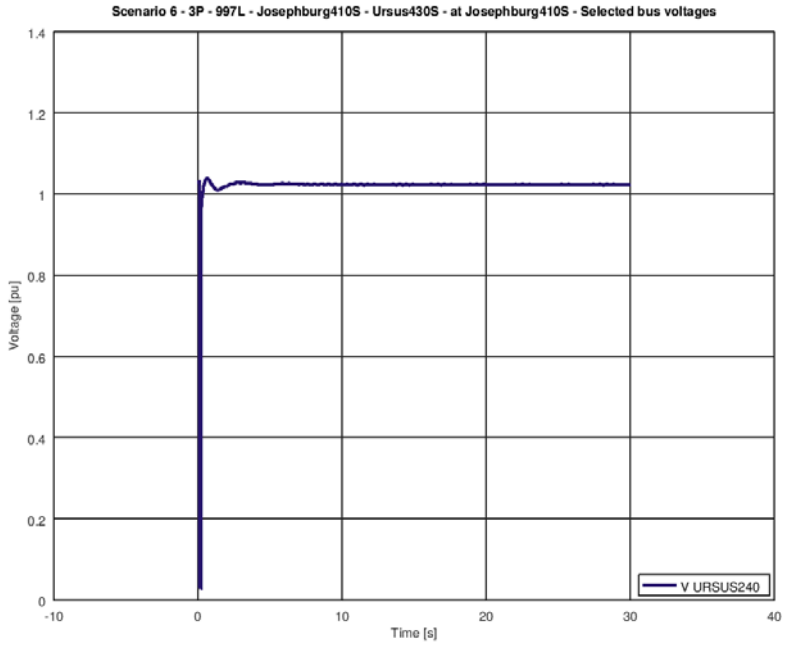


Figure A-77 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

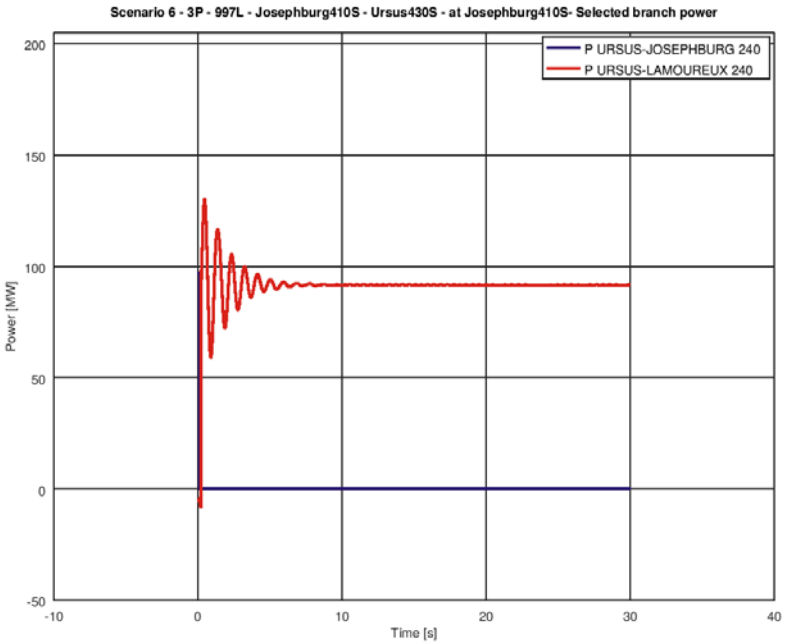


Figure A-78 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

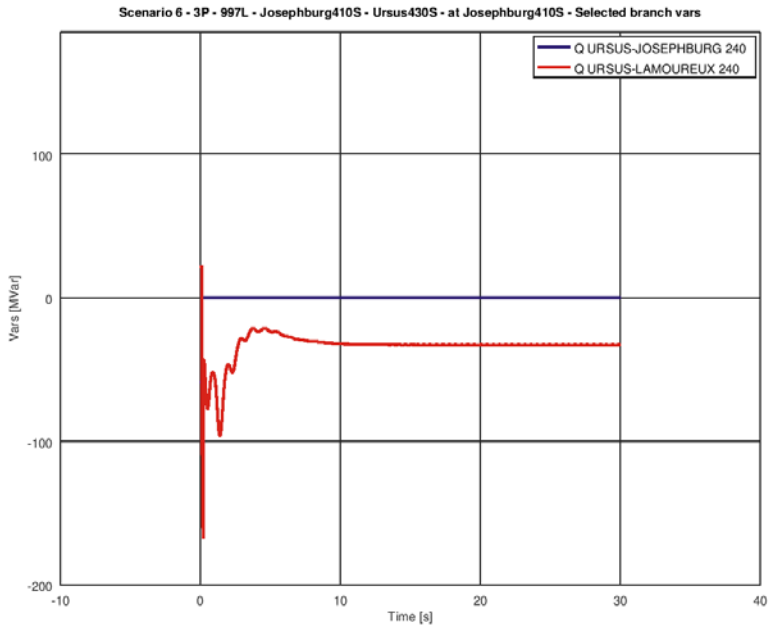


Figure A-79 Scenario 6 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

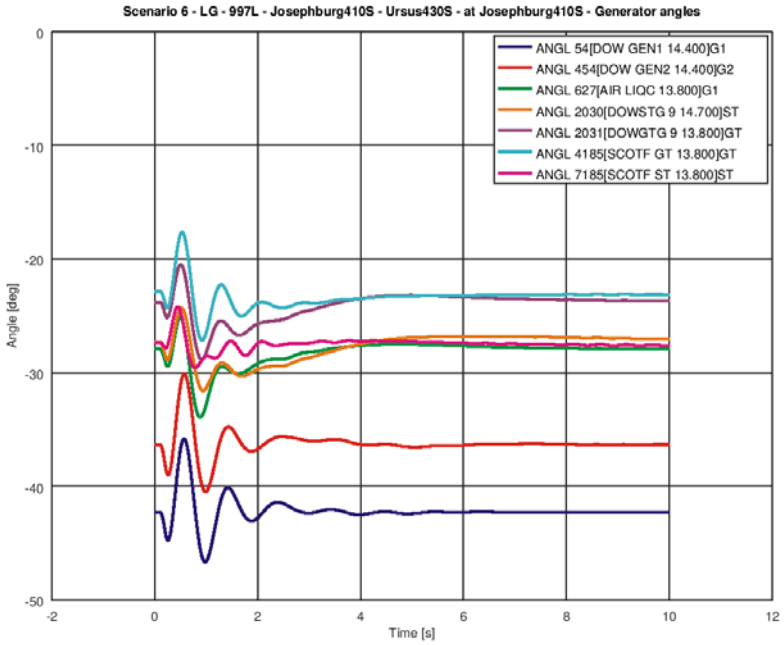


Figure A-80 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

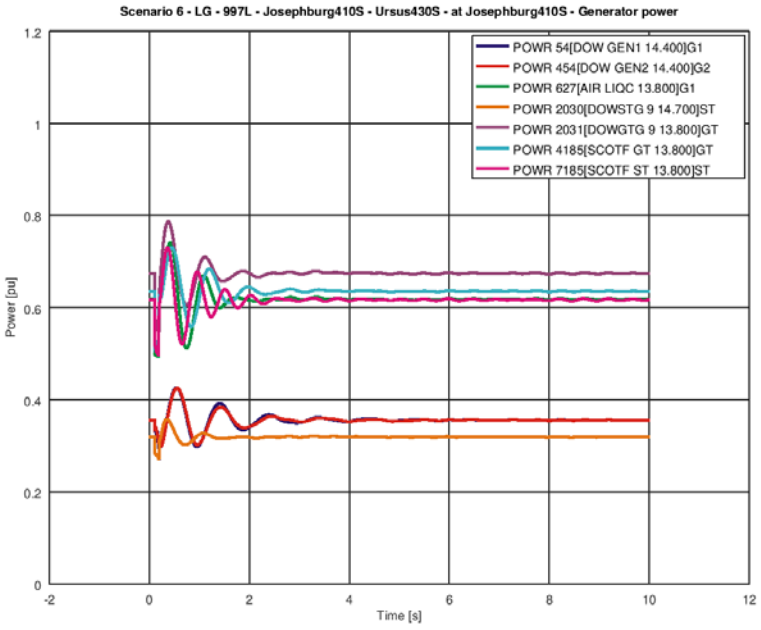


Figure A-81 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

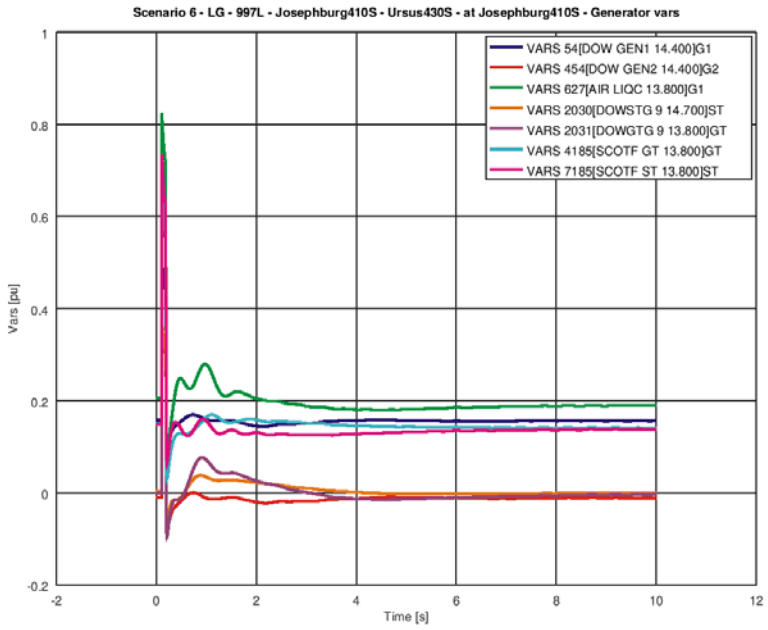


Figure A-82 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

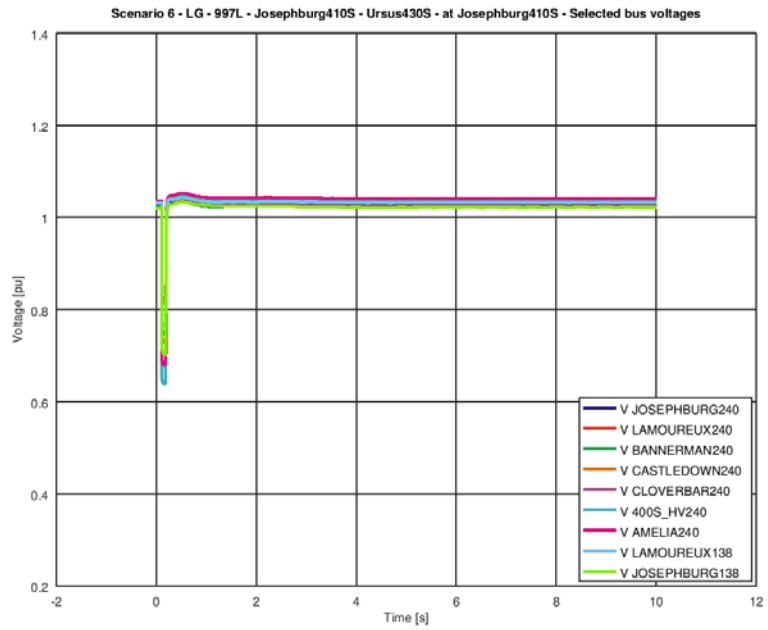


Figure A-83 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

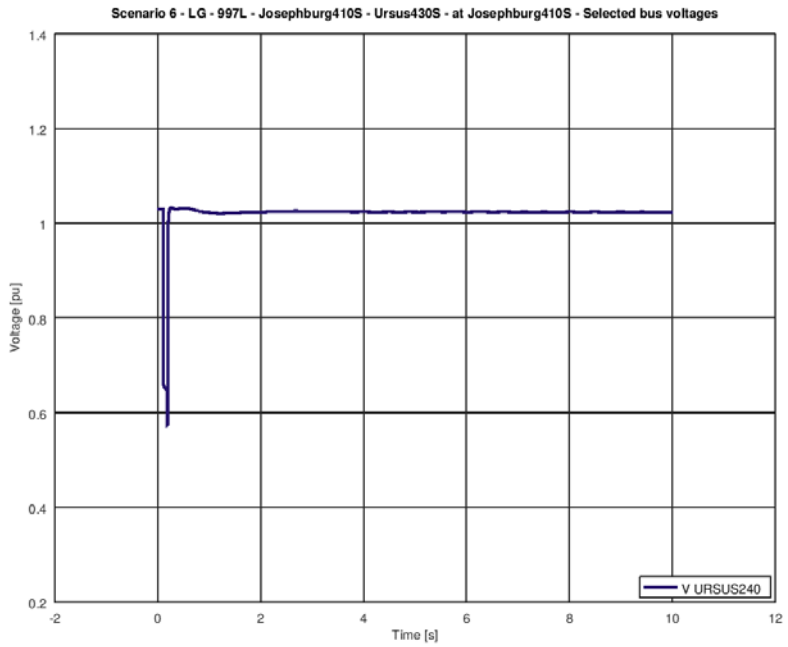


Figure A-84 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

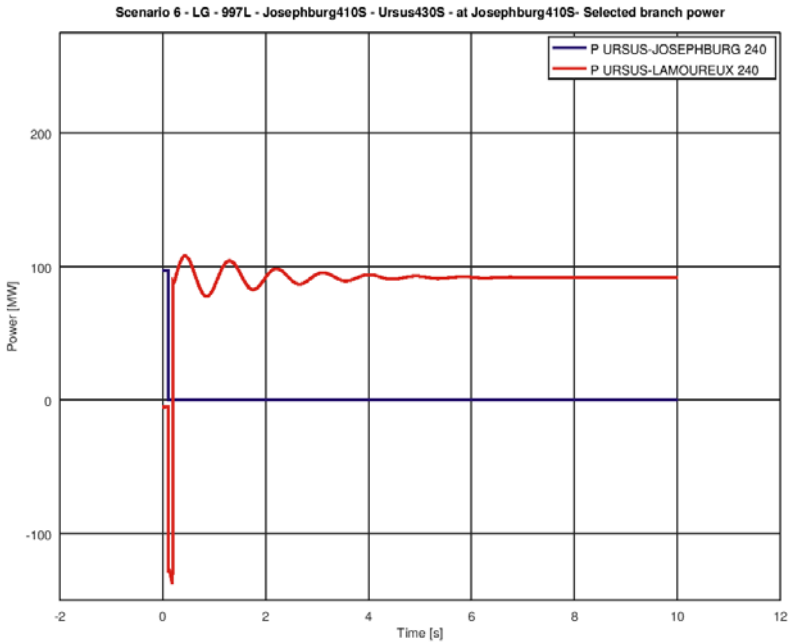


Figure A-85 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

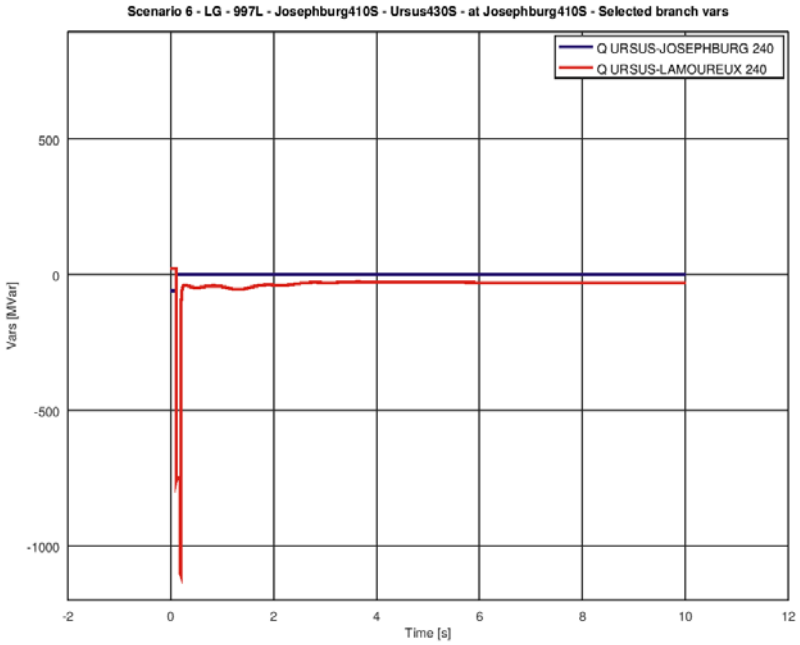


Figure A-86 Scenario 6 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

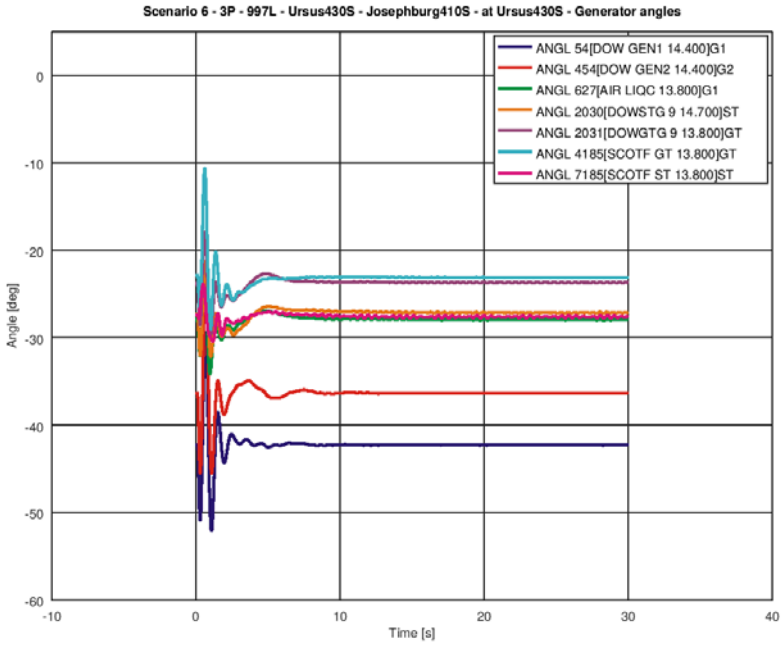


Figure A-87 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

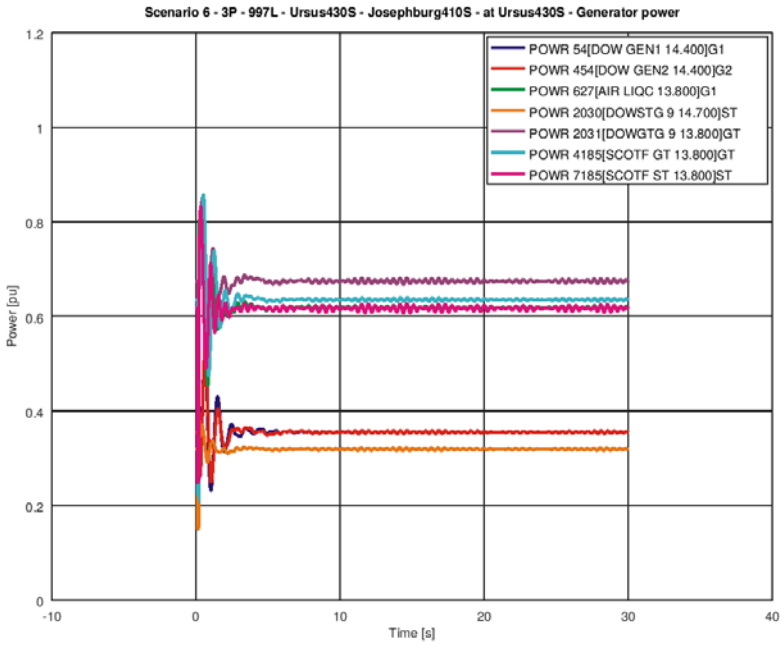


Figure A-88 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

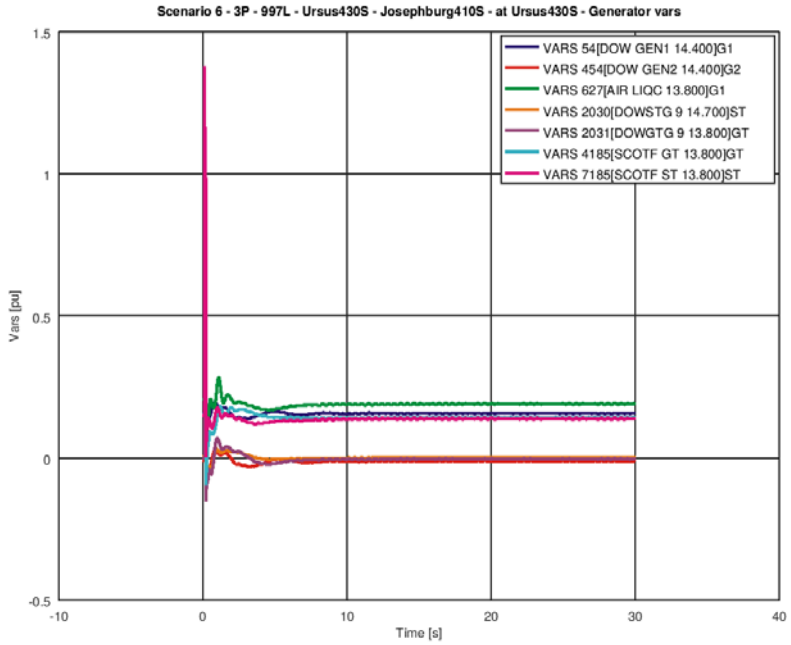


Figure A-89 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

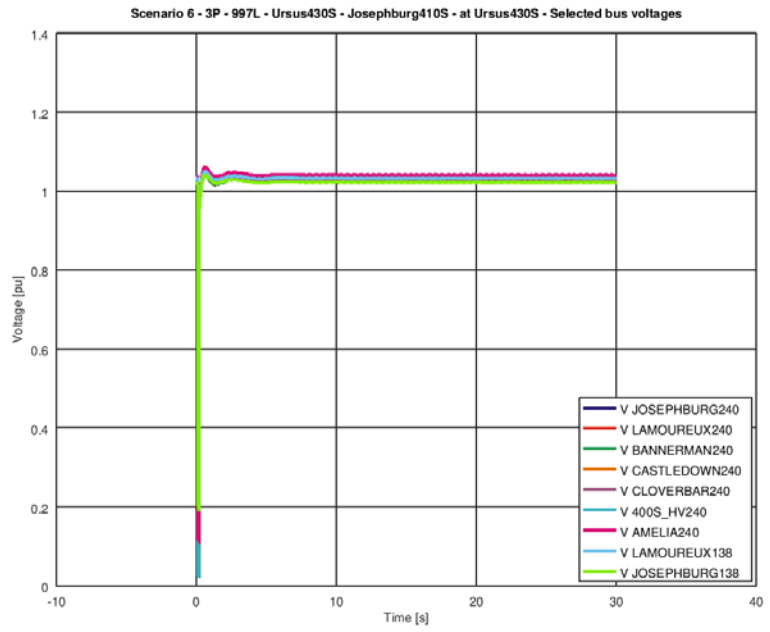


Figure A-90 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

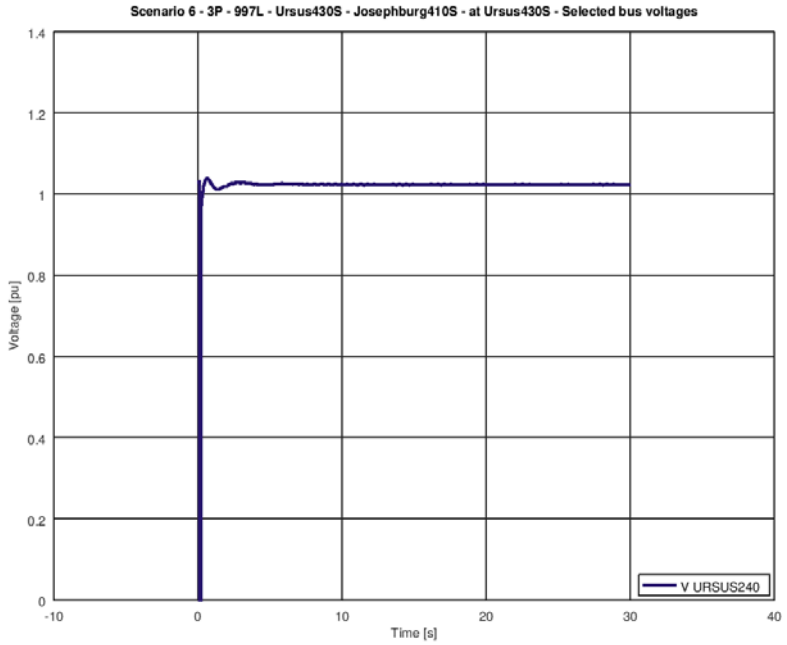


Figure A-91 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

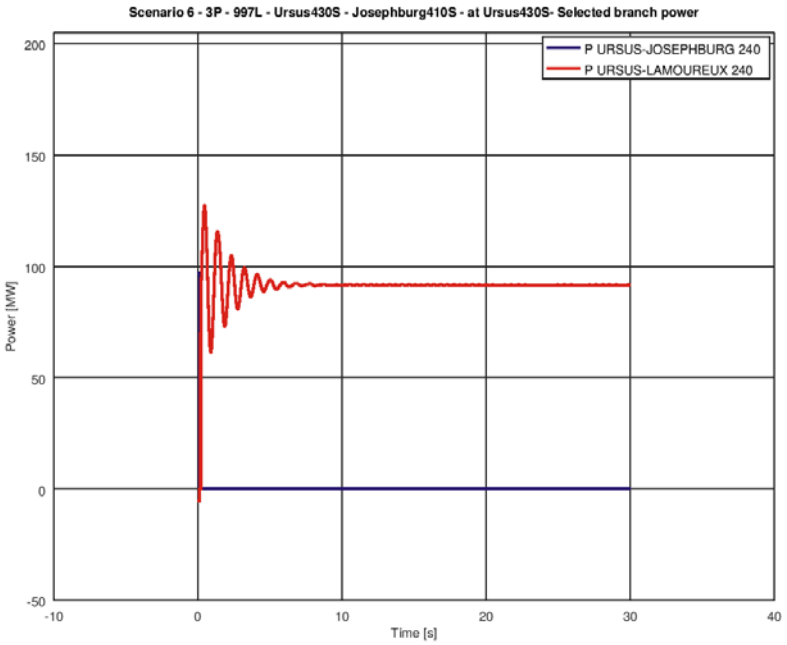


Figure A-92 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch power

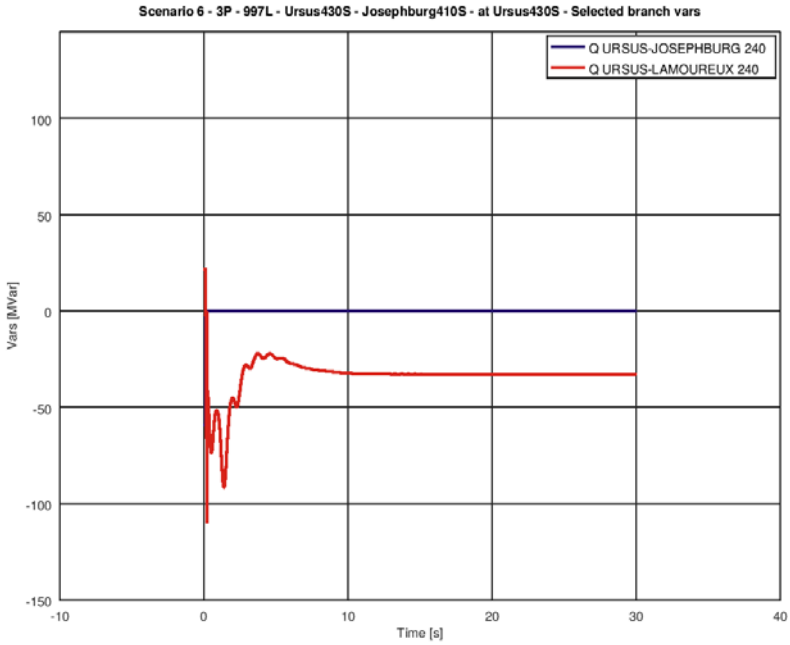


Figure A-93 Scenario 6 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch vars

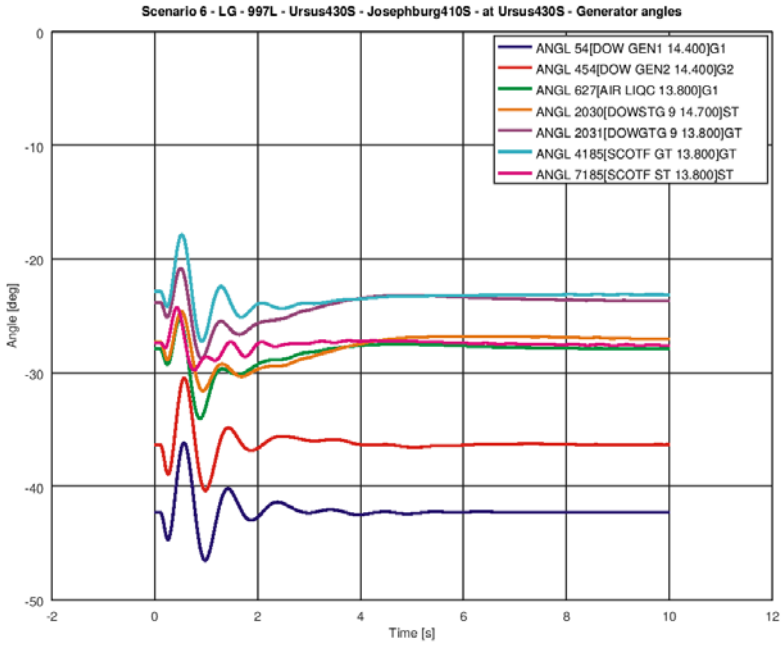


Figure A-94 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

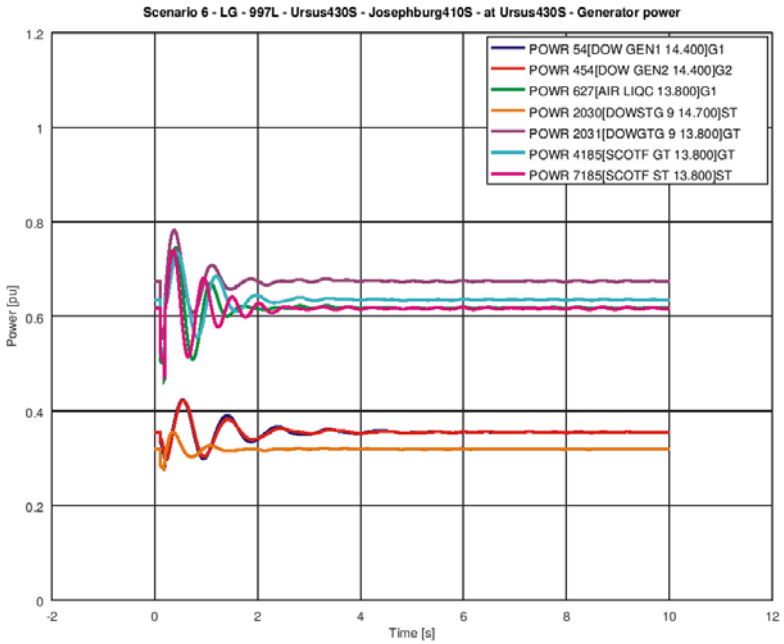


Figure A-95 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

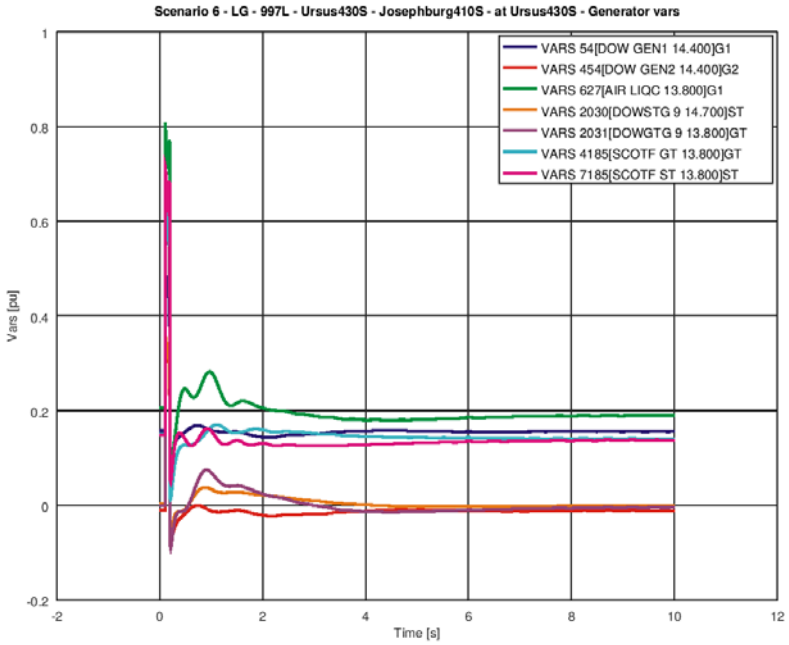


Figure A-96 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

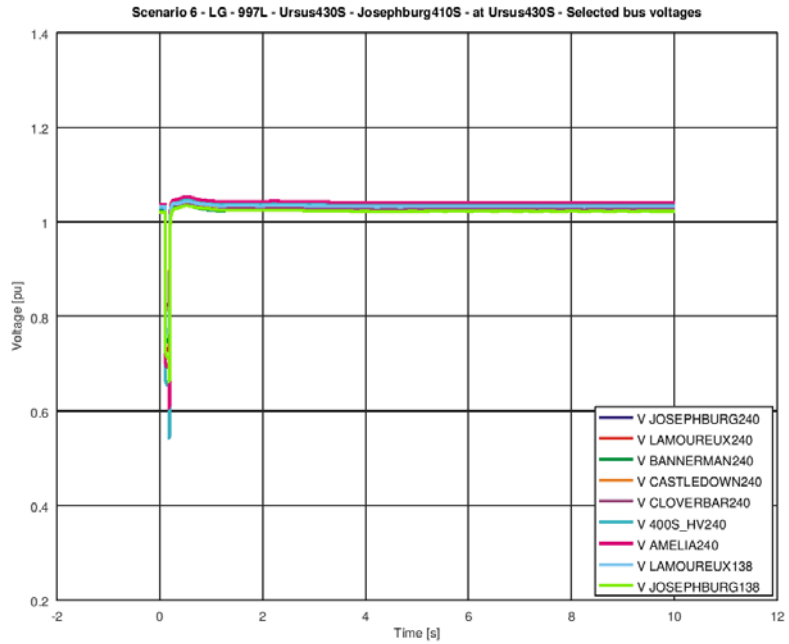


Figure A-97 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

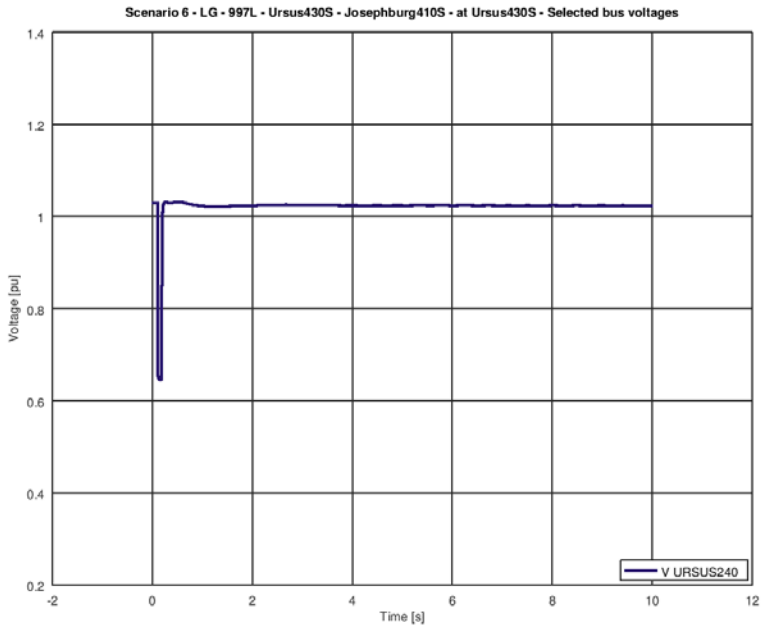


Figure A-98 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

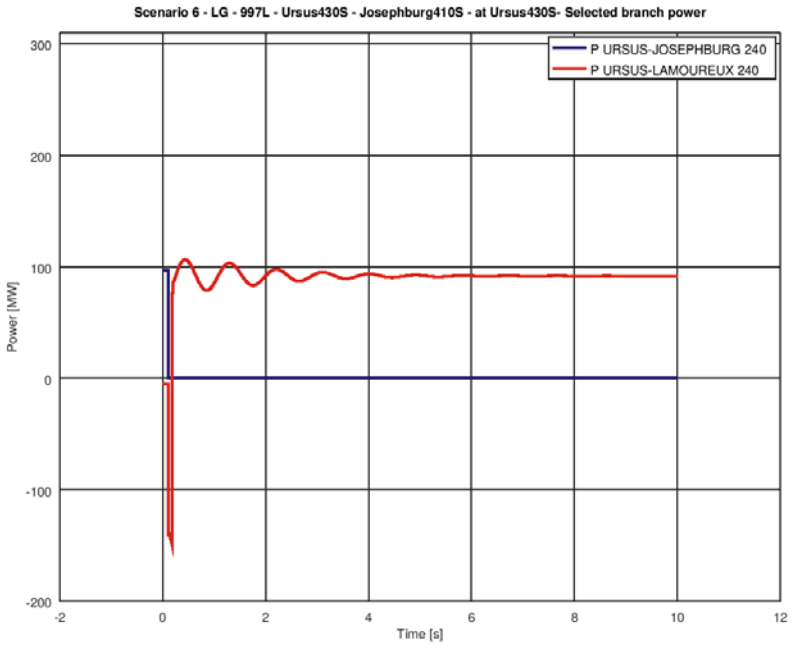


Figure A-99 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch power

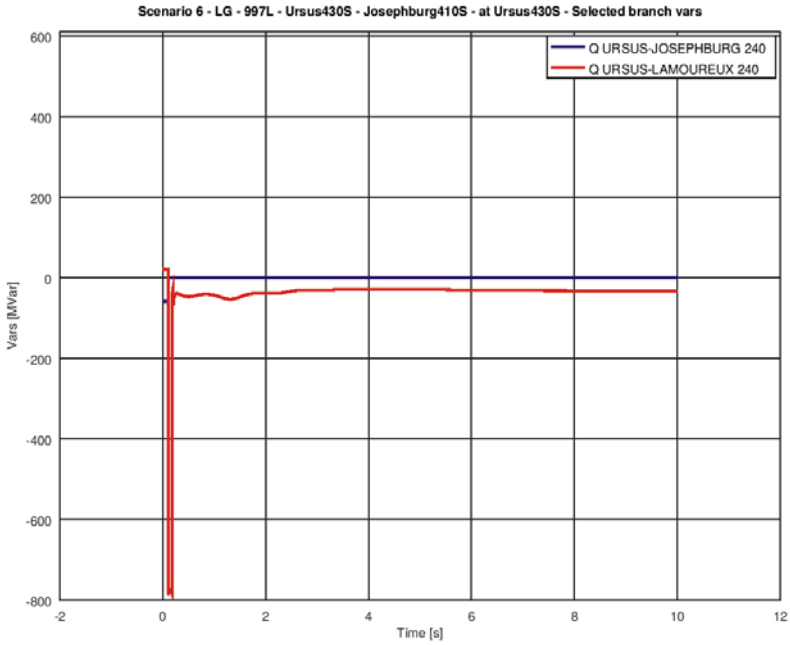


Figure A-100 Scenario 6 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch vars

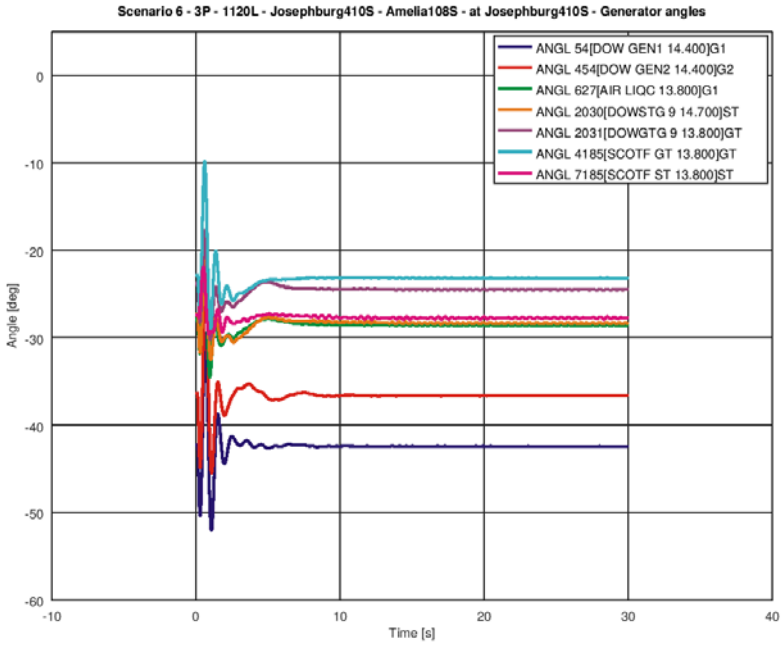


Figure A-101 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

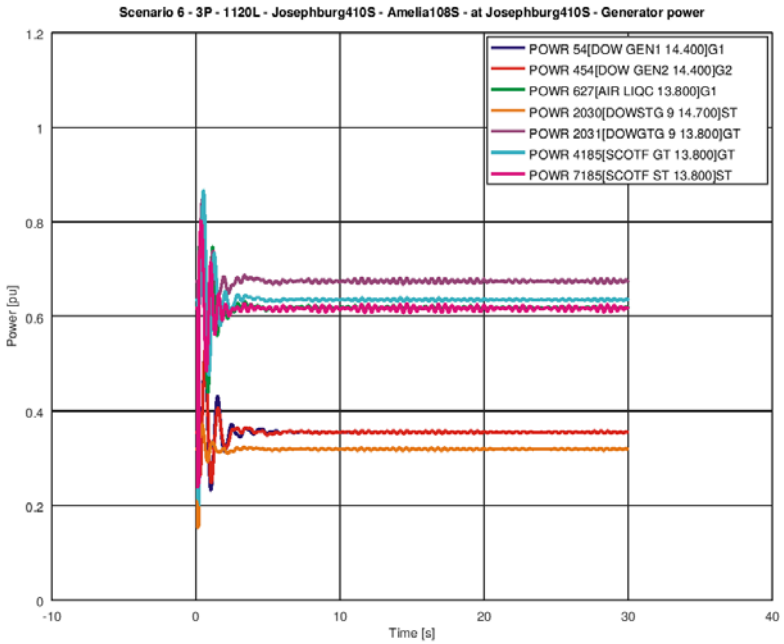


Figure A-102 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

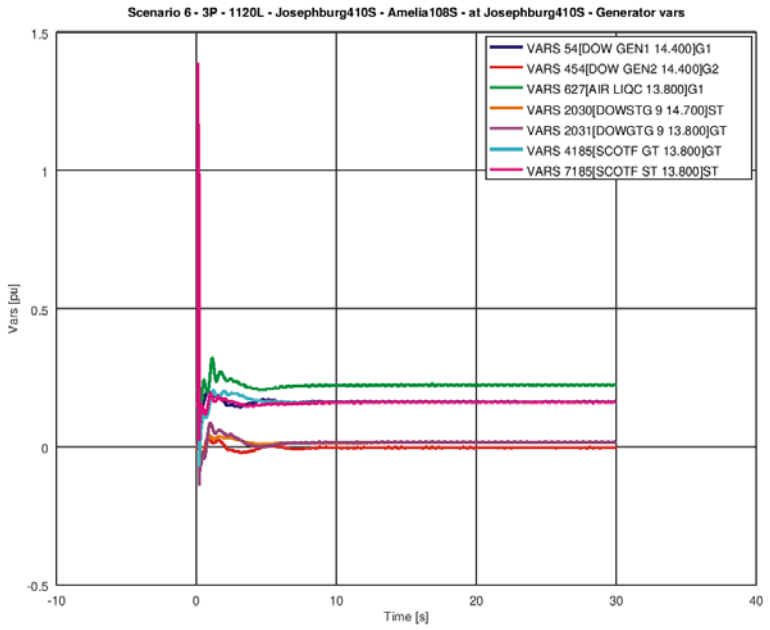


Figure A-103 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

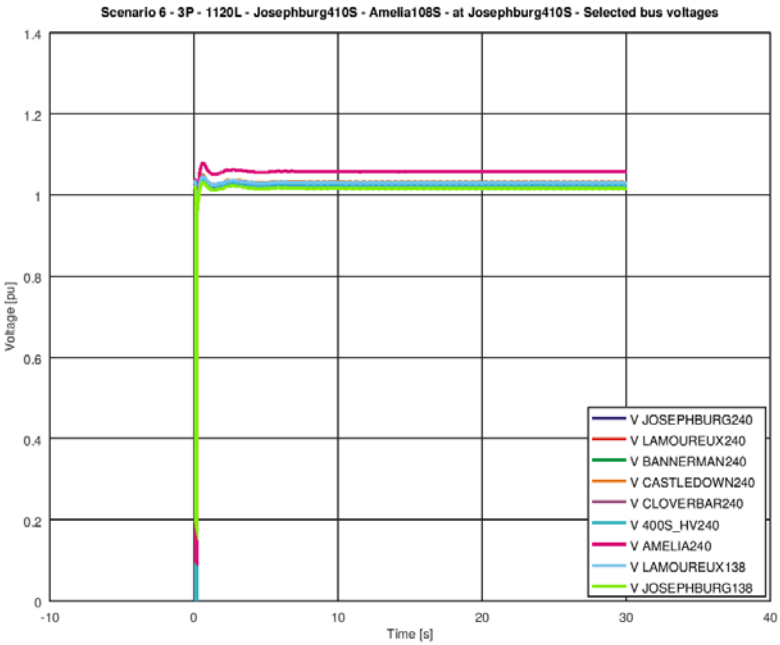


Figure A-104 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

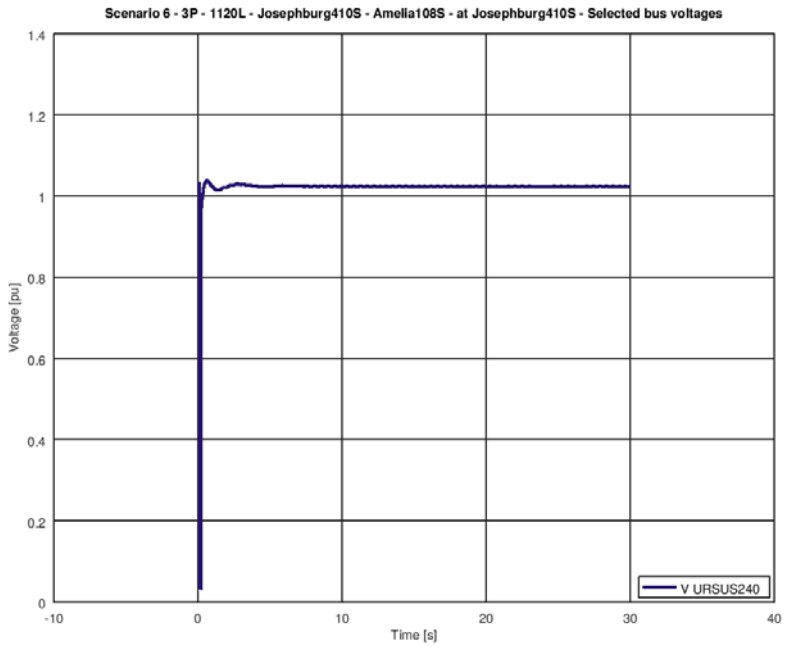


Figure A-105 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

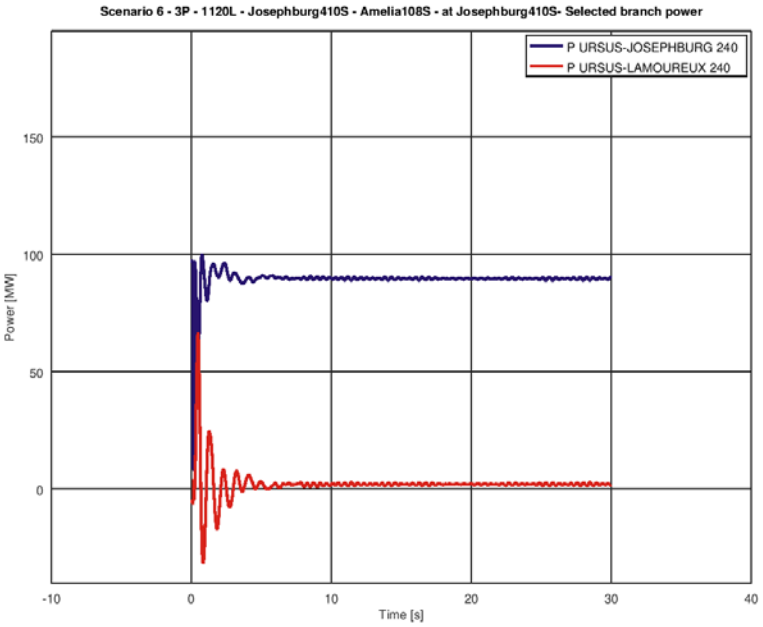


Figure A-106 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

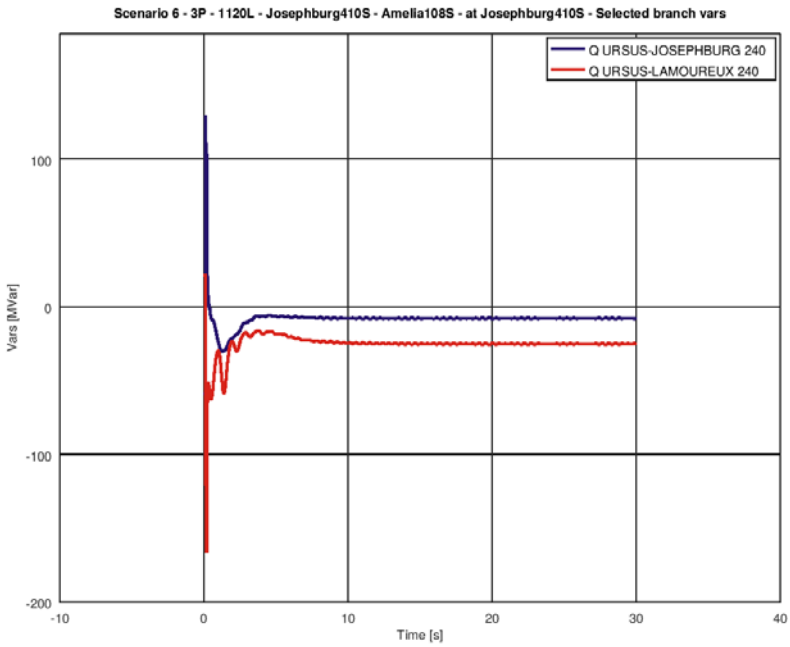


Figure A-107 Scenario 6 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

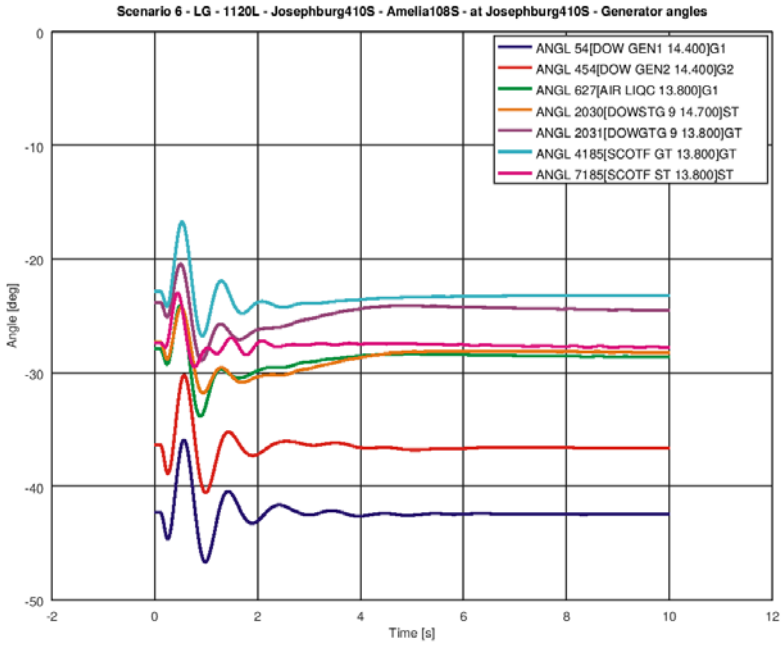


Figure A-108 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

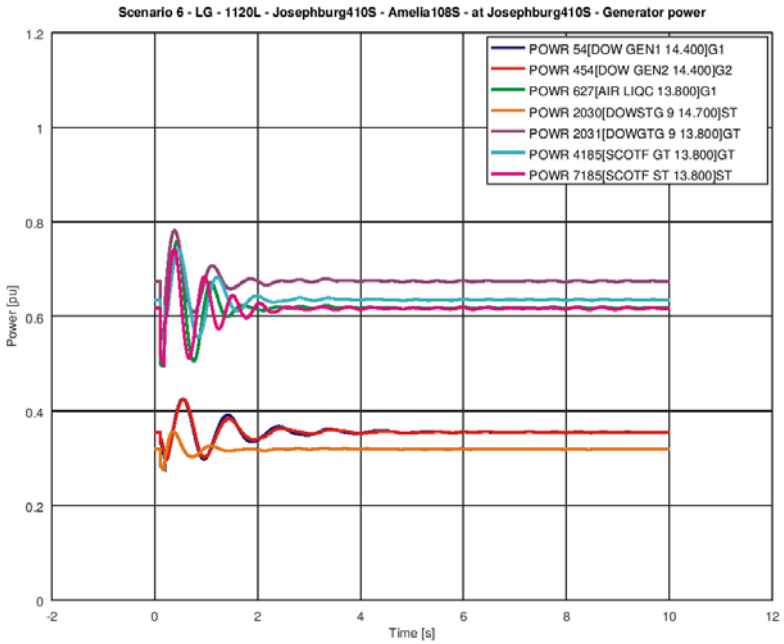


Figure A-109 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

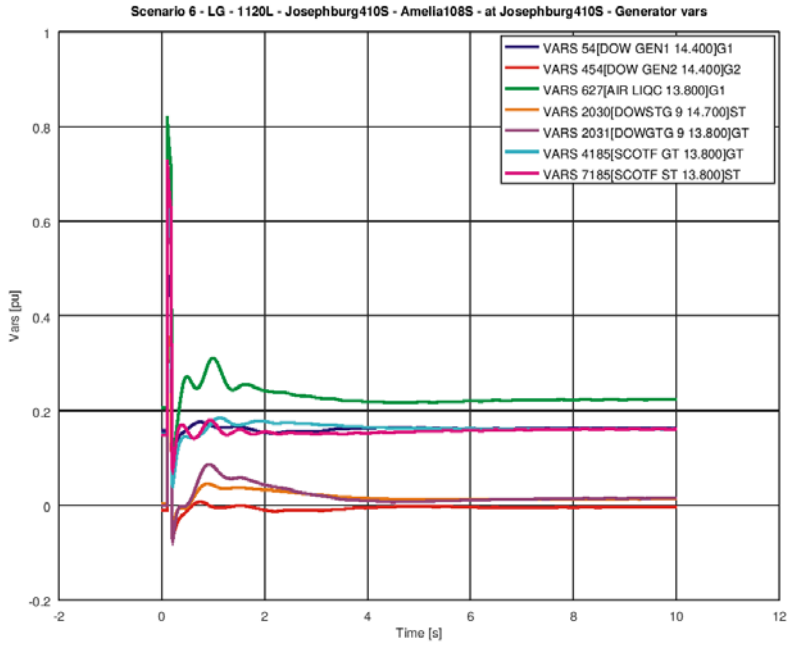


Figure A-110 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

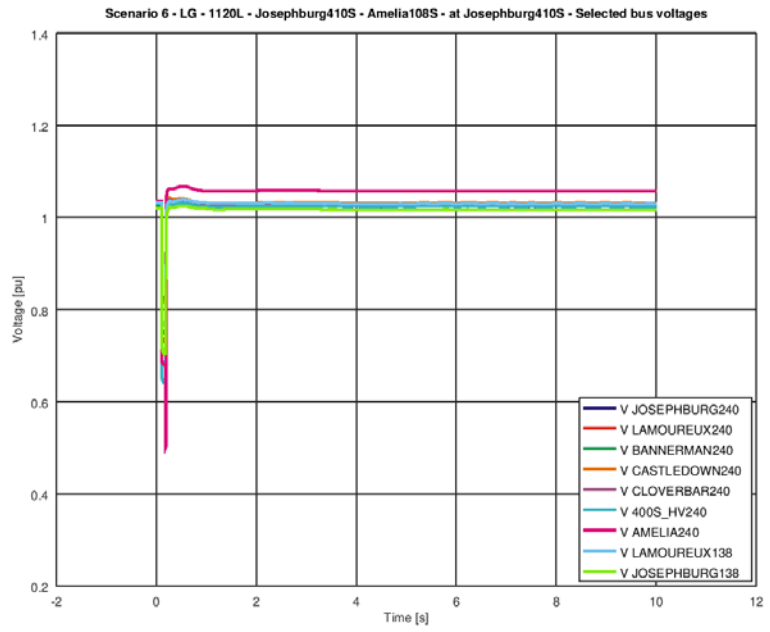


Figure A-111 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

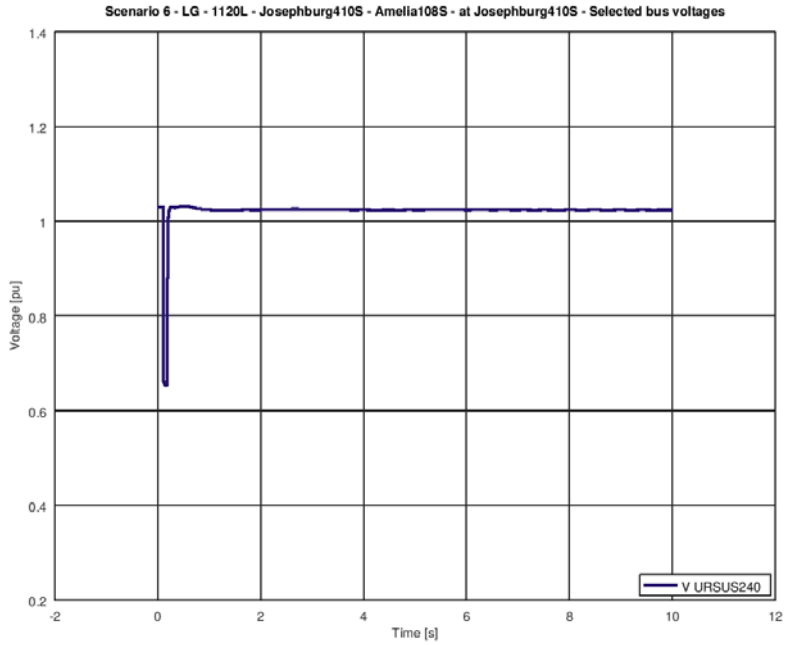


Figure A-112 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

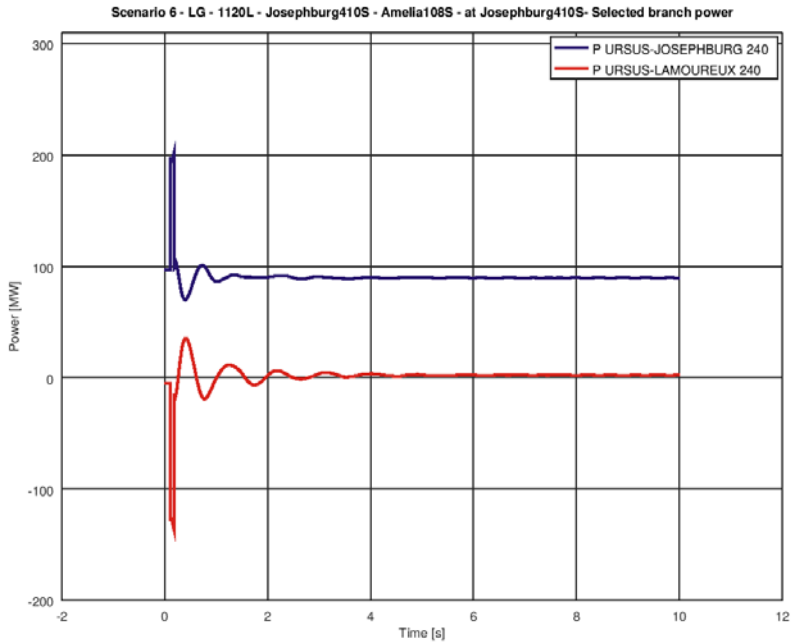


Figure A-113 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

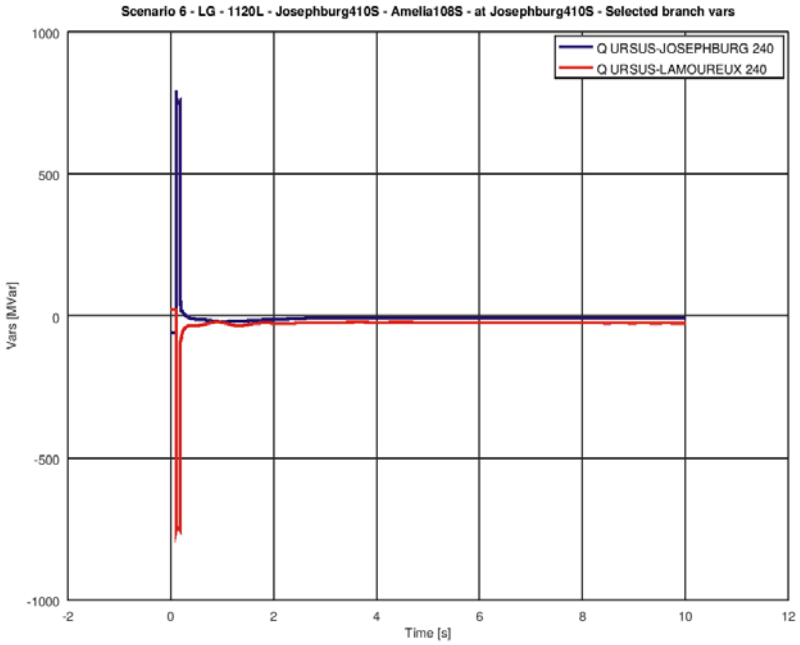


Figure A-114 Scenario 6 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

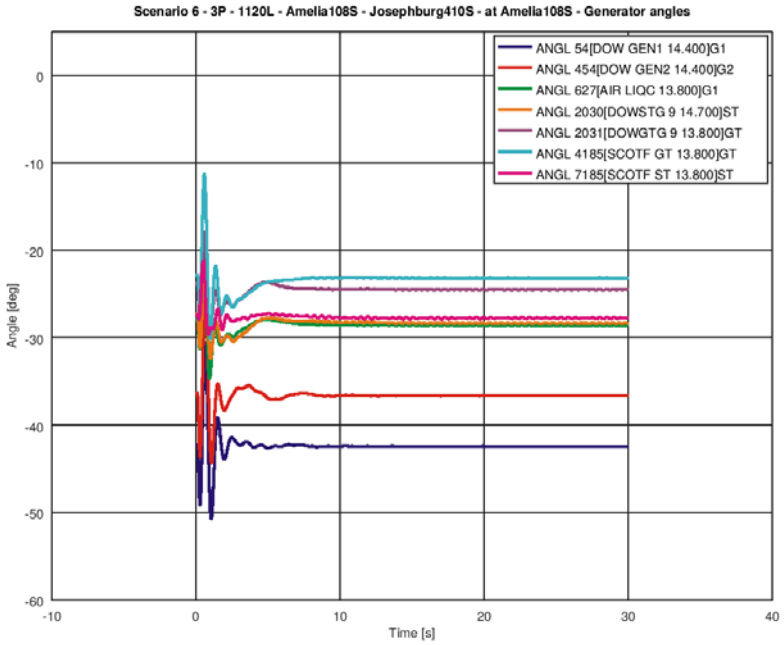


Figure A-115 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

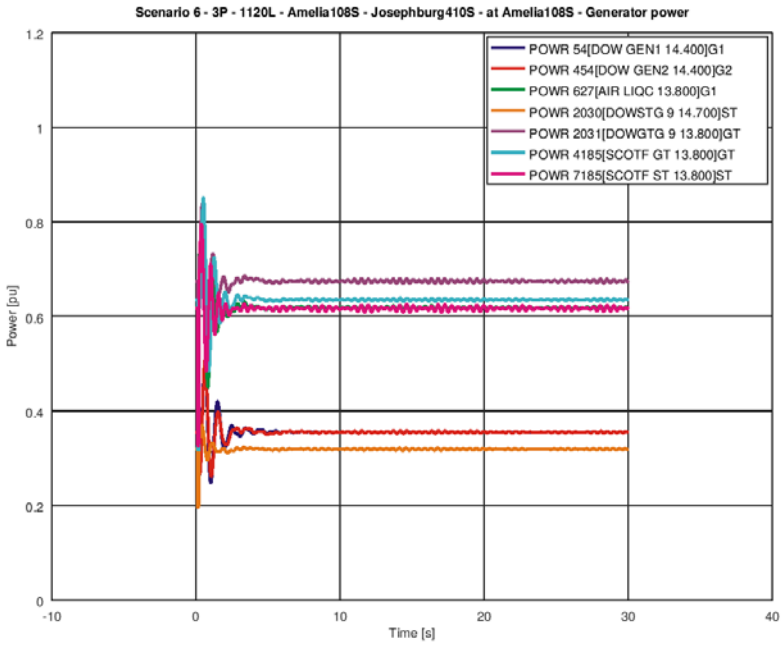


Figure A-116 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

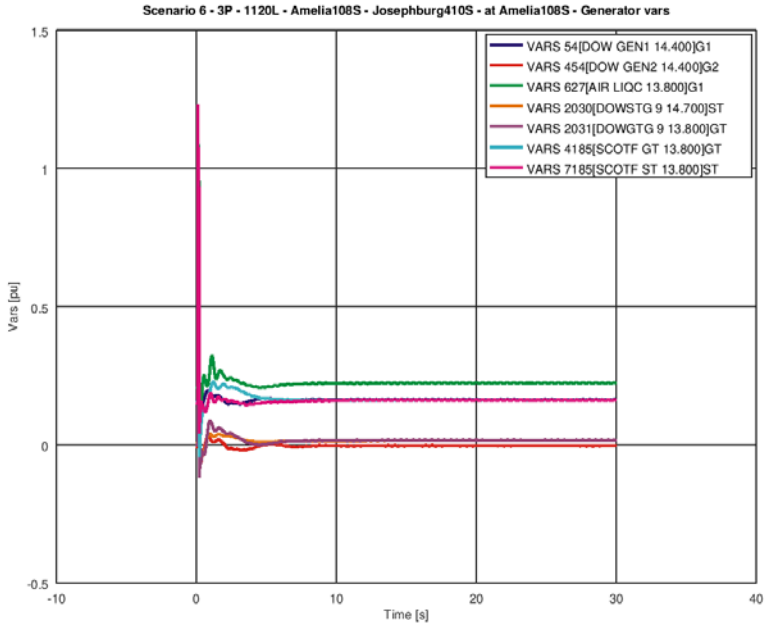


Figure A-117 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

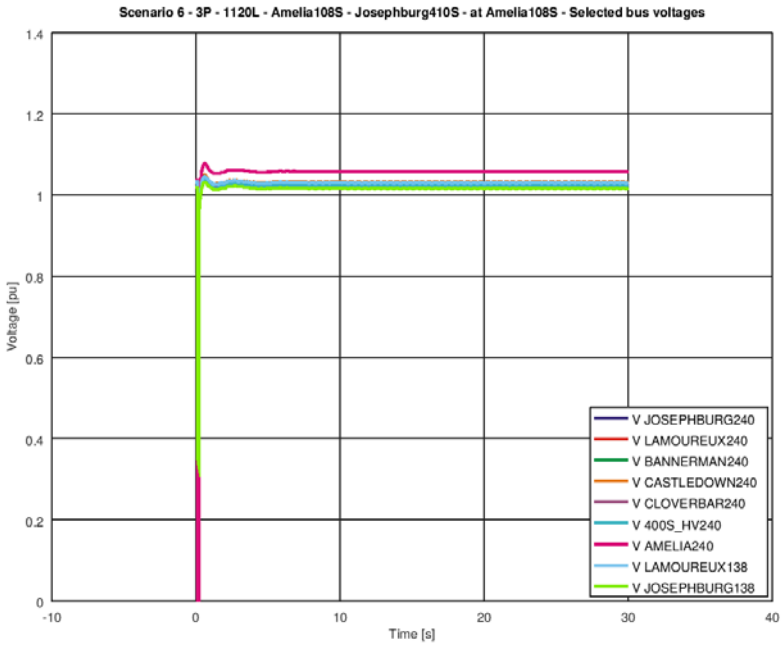


Figure A-118 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

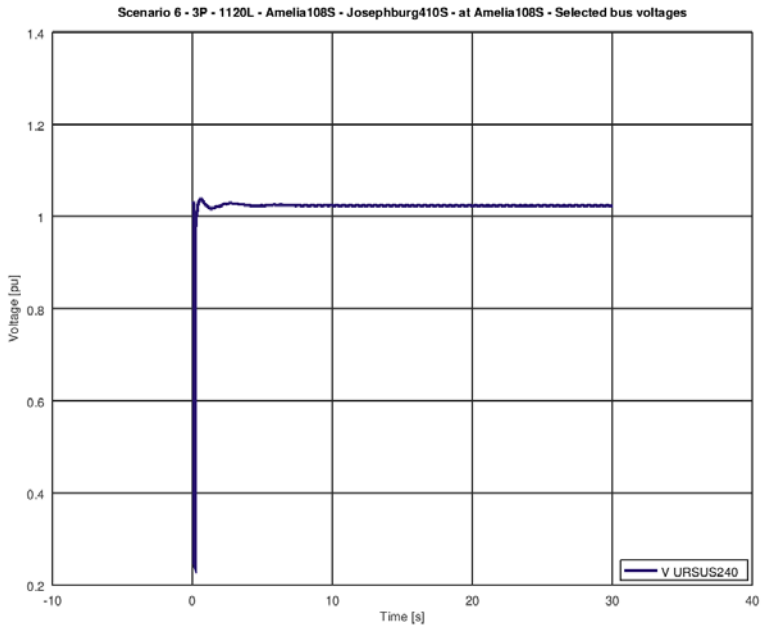


Figure A-119 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

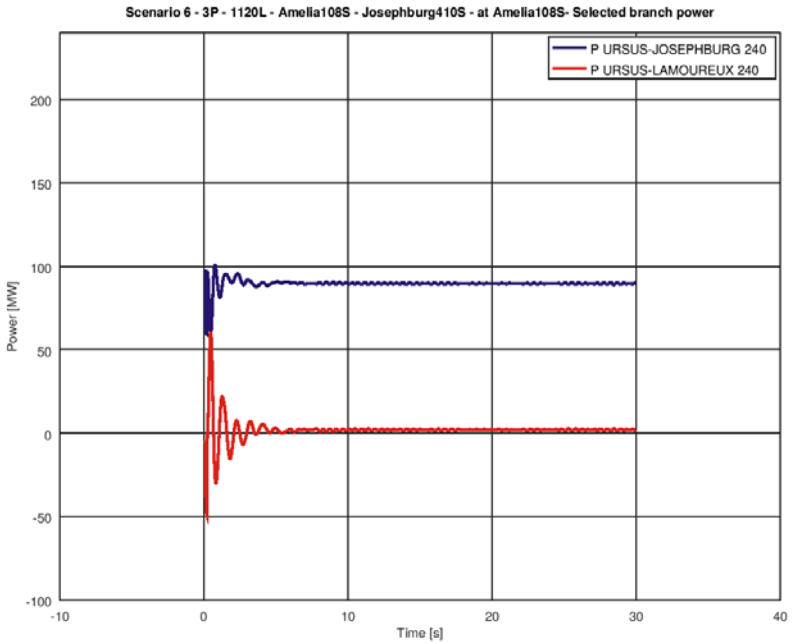


Figure A-120 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

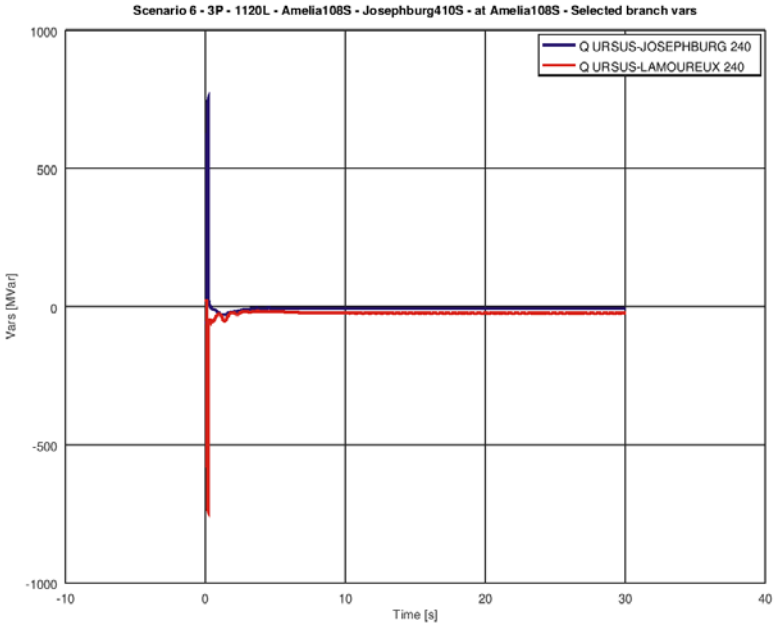


Figure A-121 Scenario 6 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

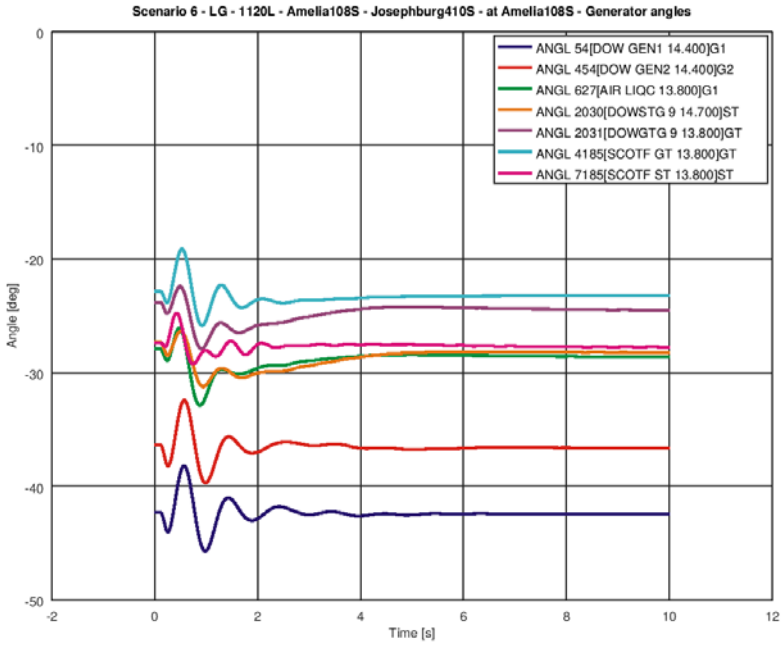


Figure A-122 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

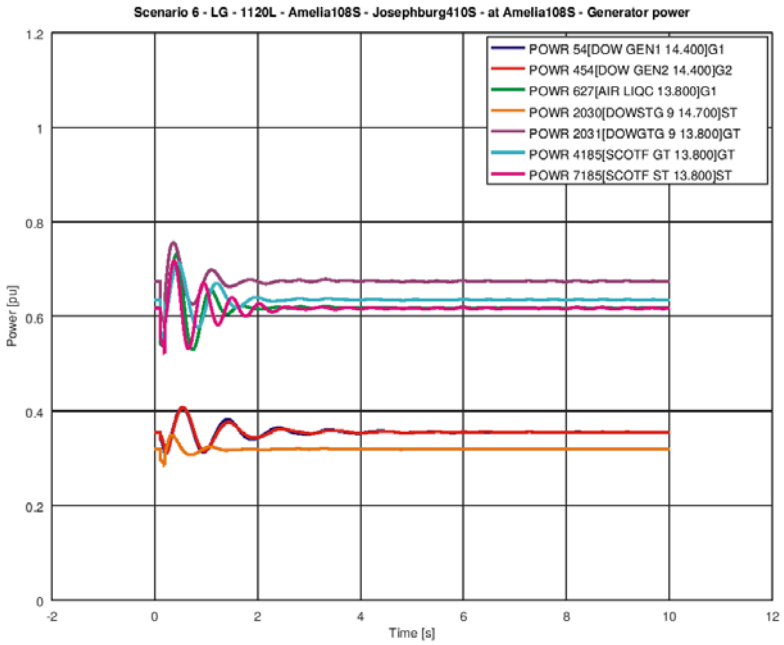


Figure A-123 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

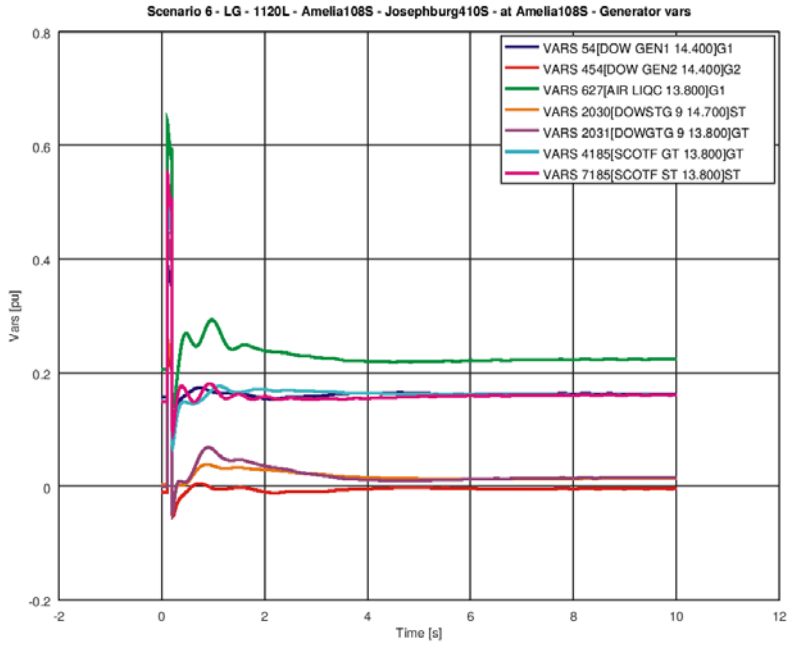


Figure A-124 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

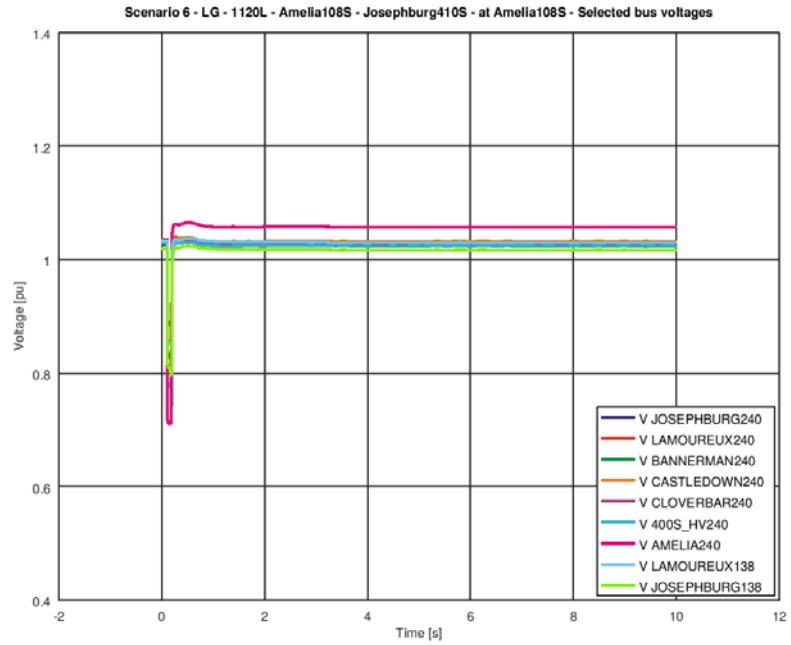


Figure A-125 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

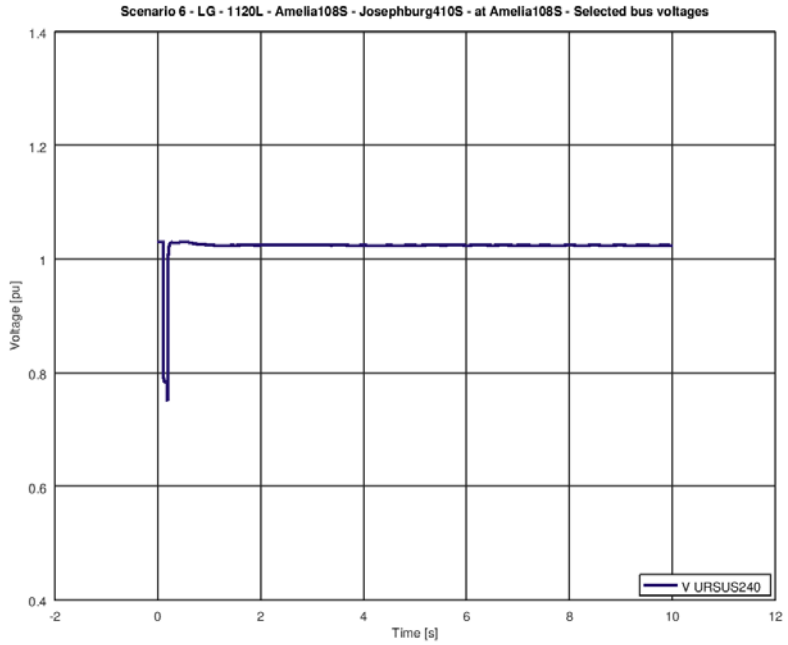


Figure A-126 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

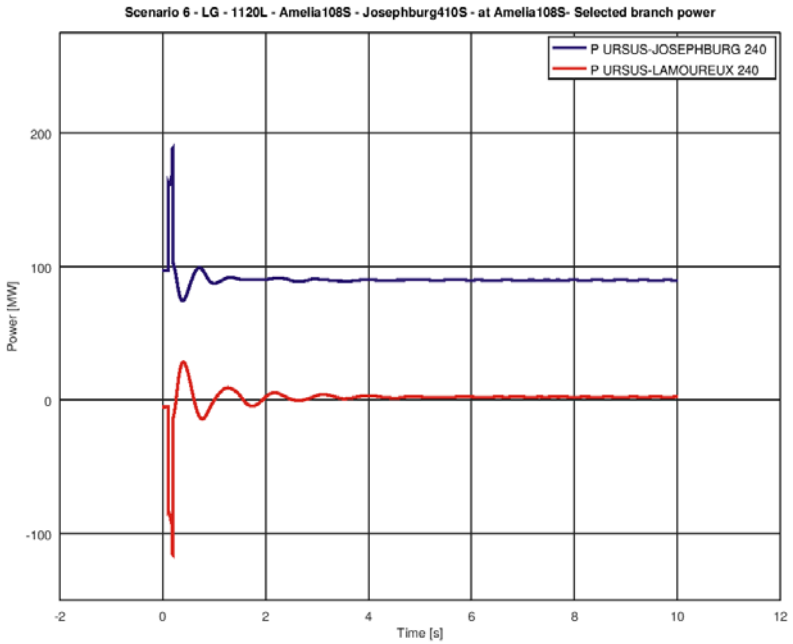


Figure A-127 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

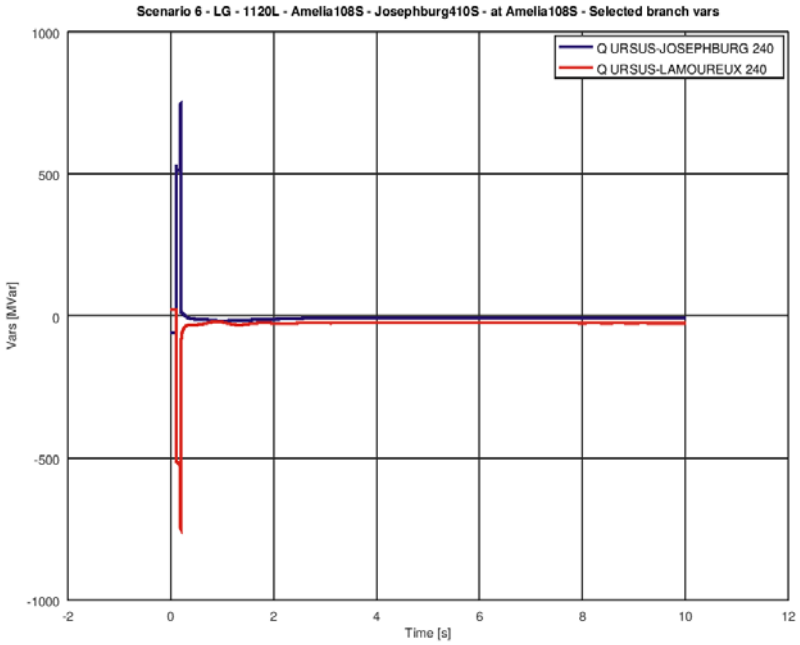


Figure A-128 Scenario 6 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

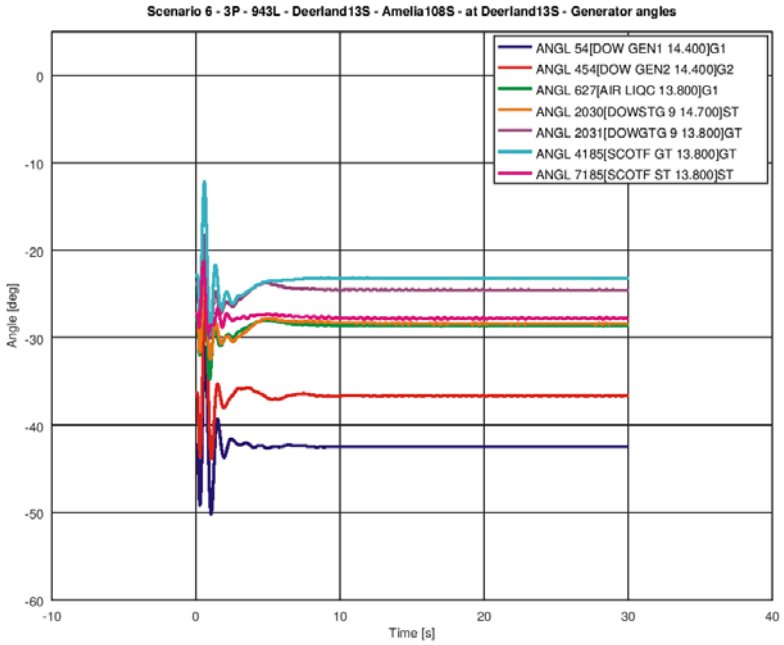


Figure A-129 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

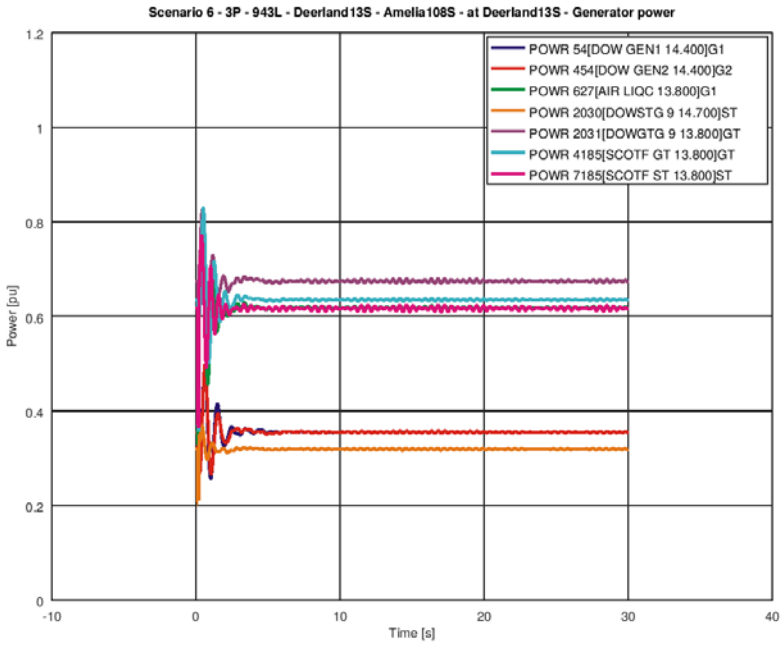


Figure A-130 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

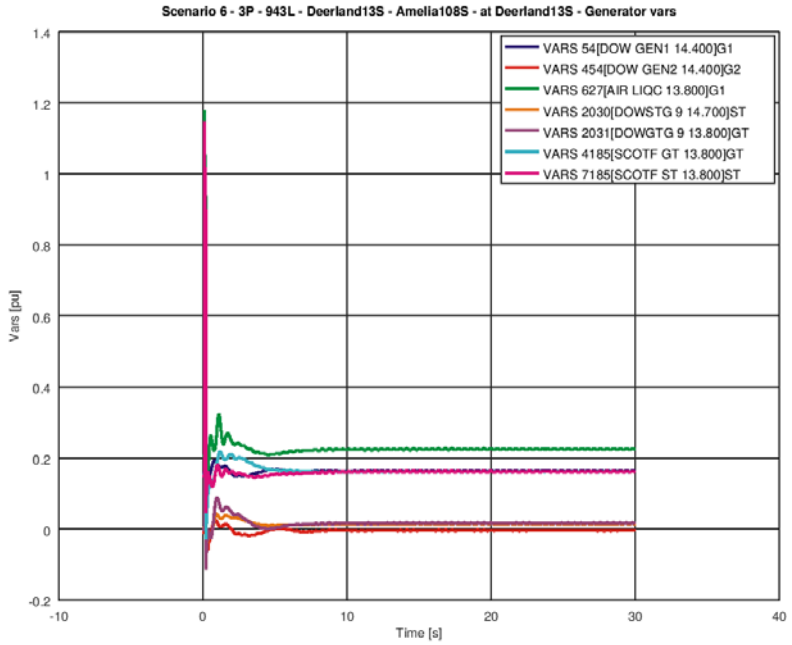


Figure A-131 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

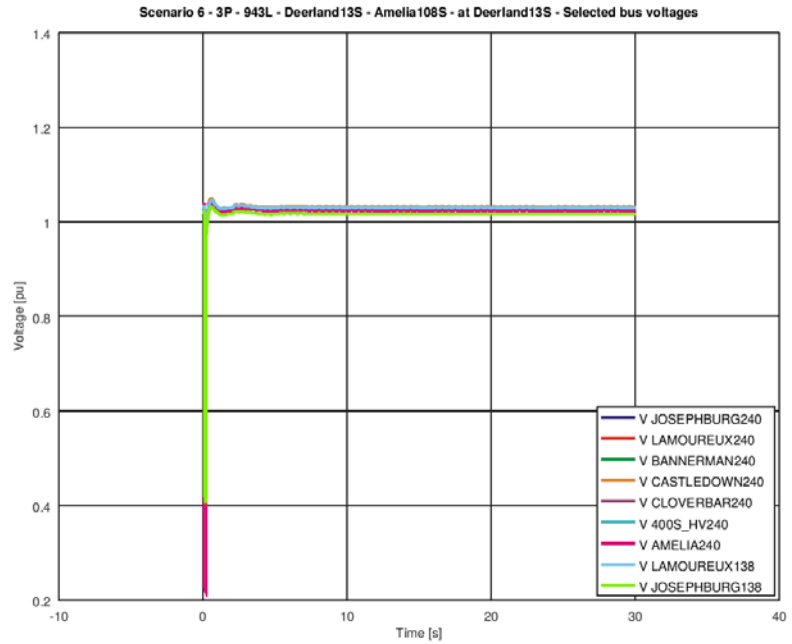


Figure A-132 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

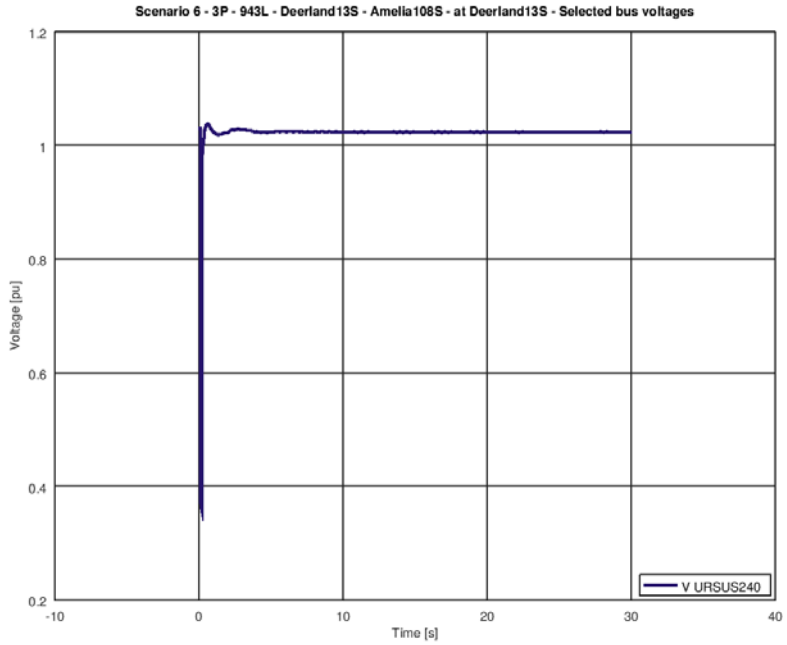


Figure A-133 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

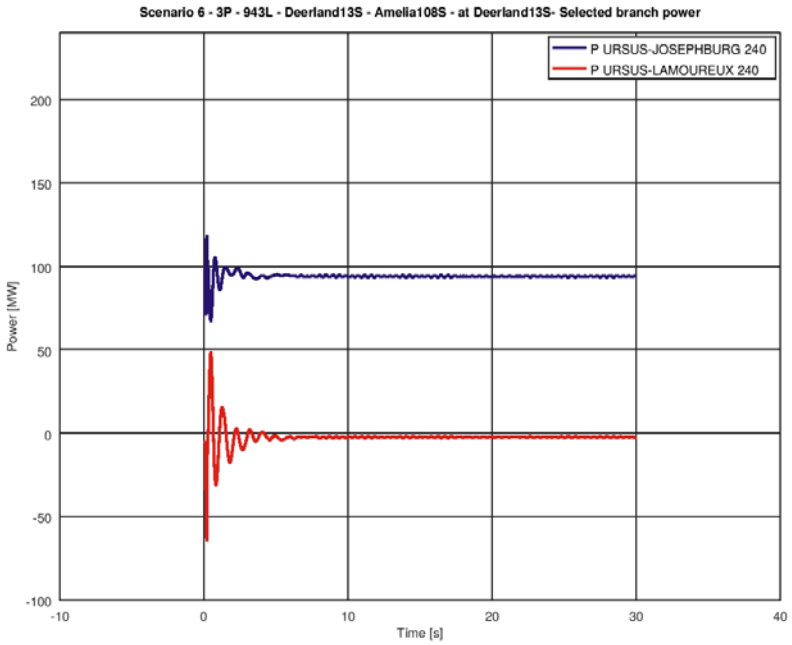


Figure A-134 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

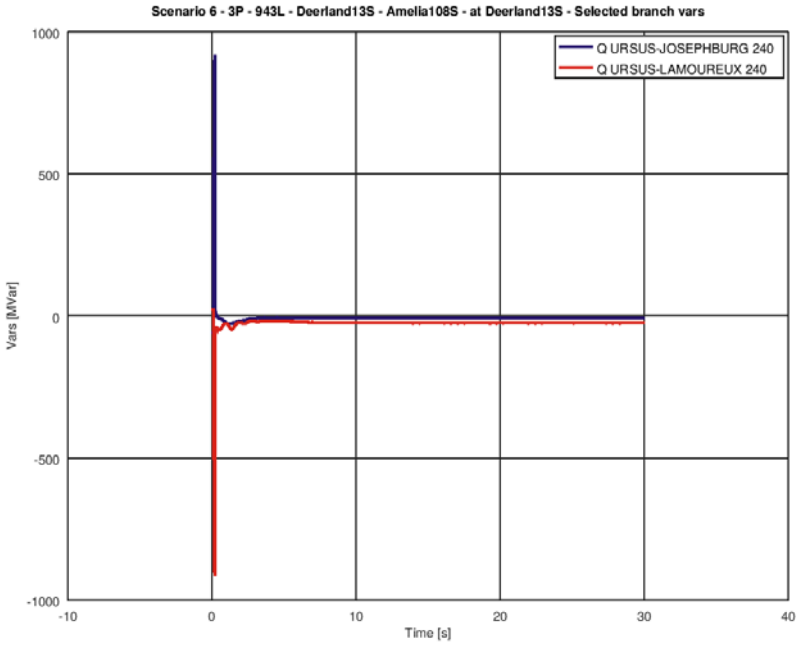


Figure A-135 Scenario 6 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

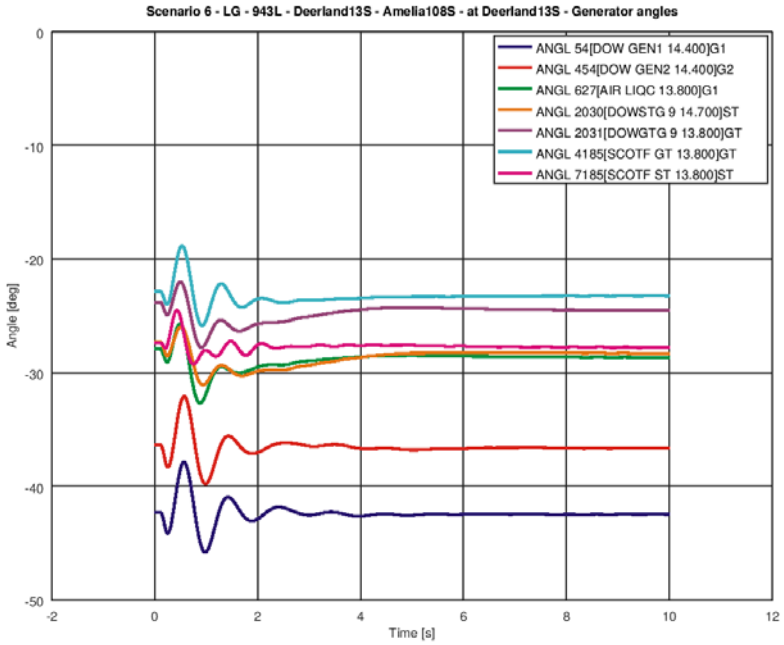


Figure A-136 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

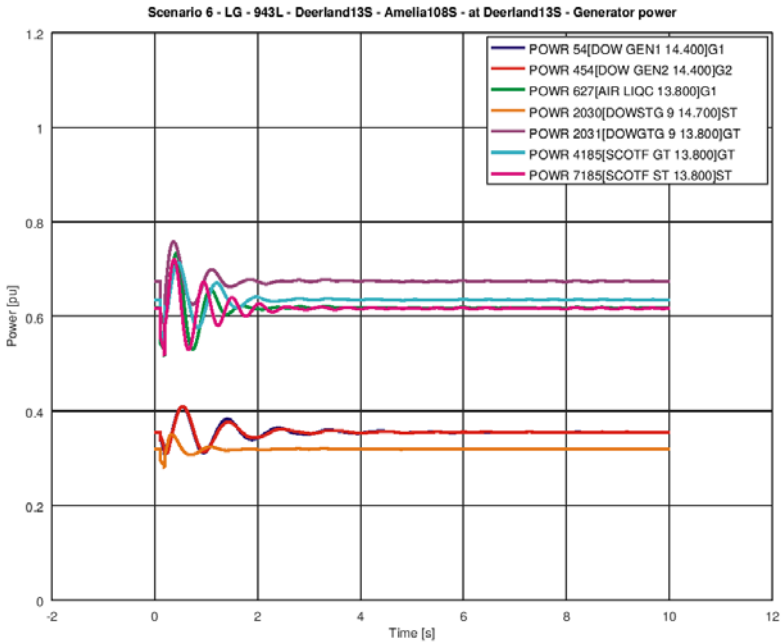


Figure A-137 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

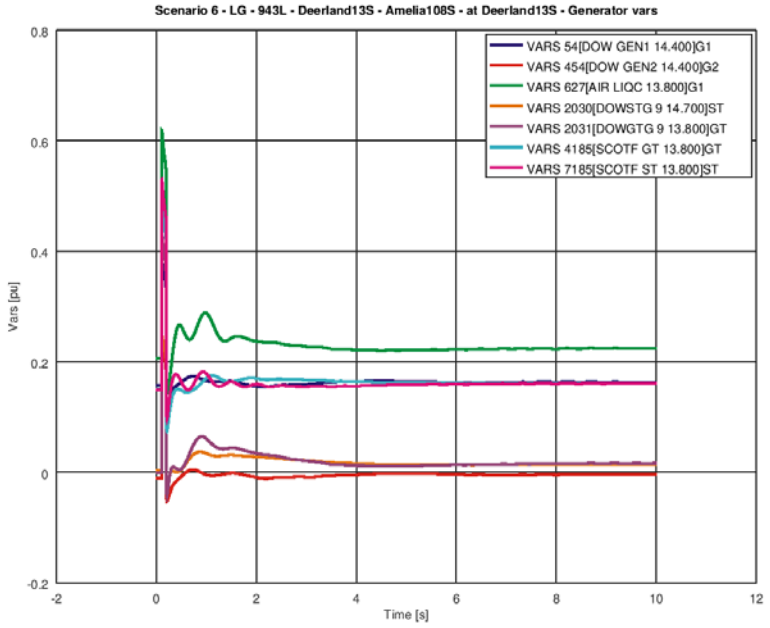


Figure A-138 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

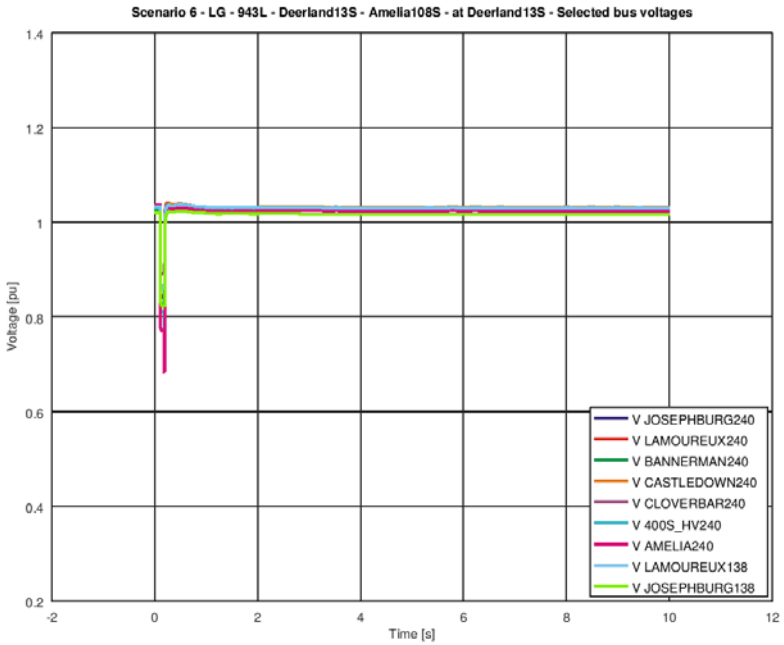


Figure A-139 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

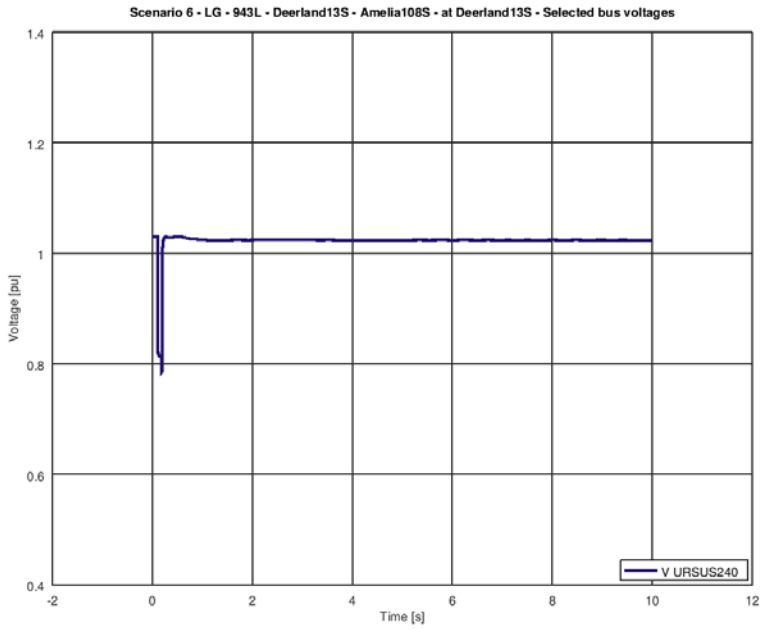


Figure A-140 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

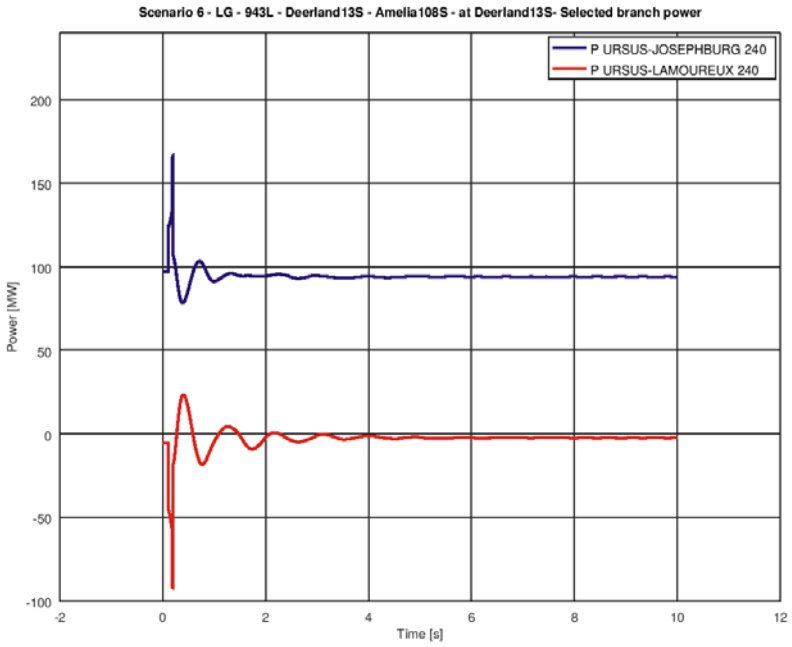


Figure A-141 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

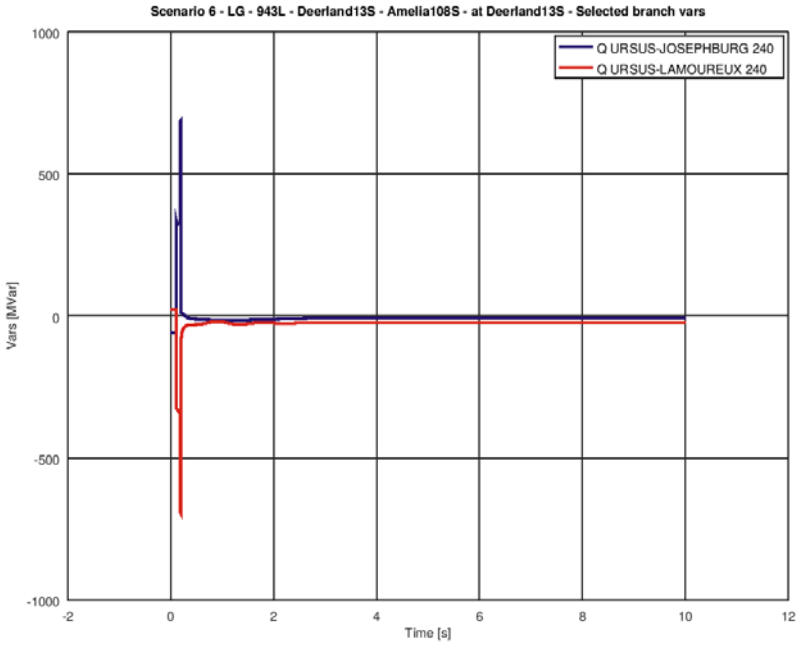


Figure A-142 Scenario 6 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

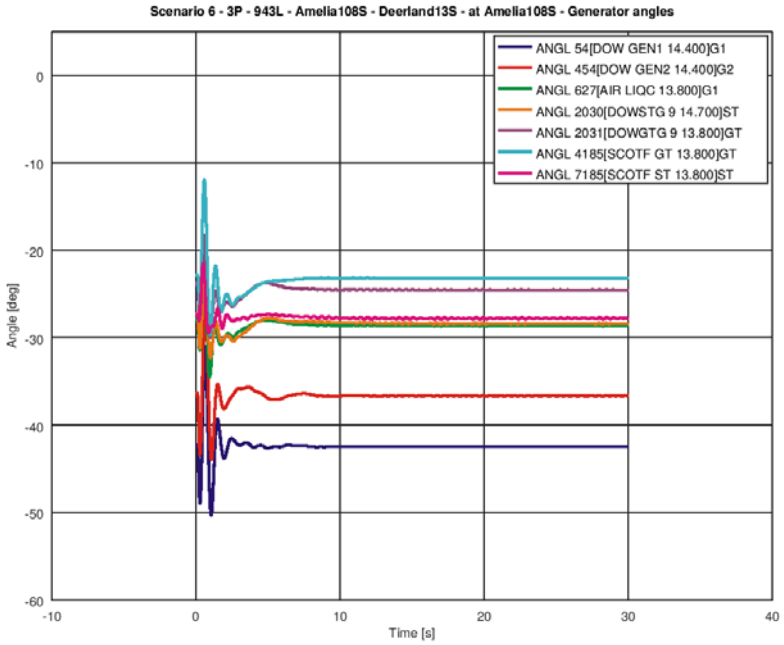


Figure A-143 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

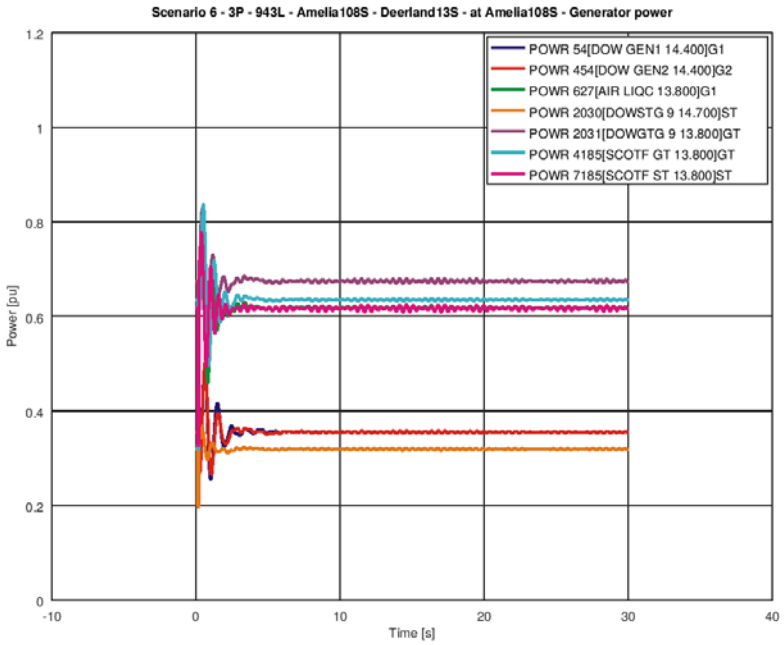


Figure A-144 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

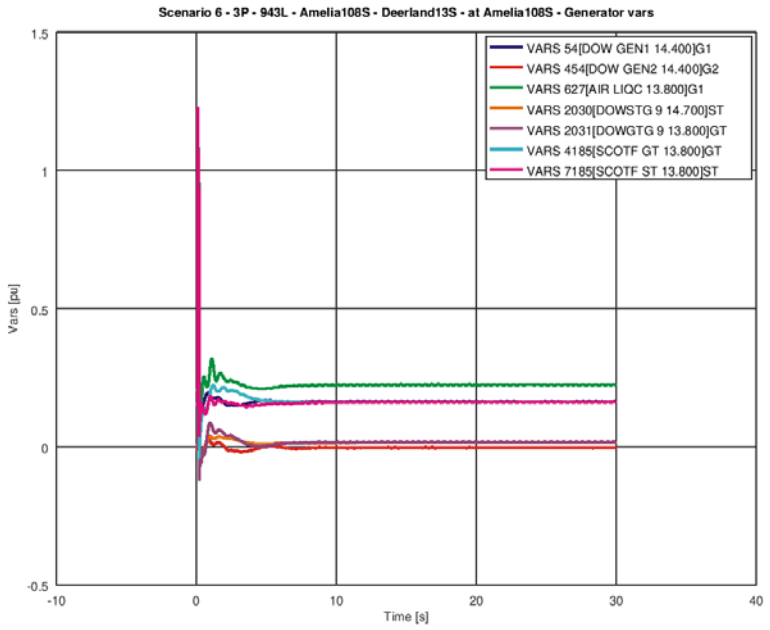


Figure A-145 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

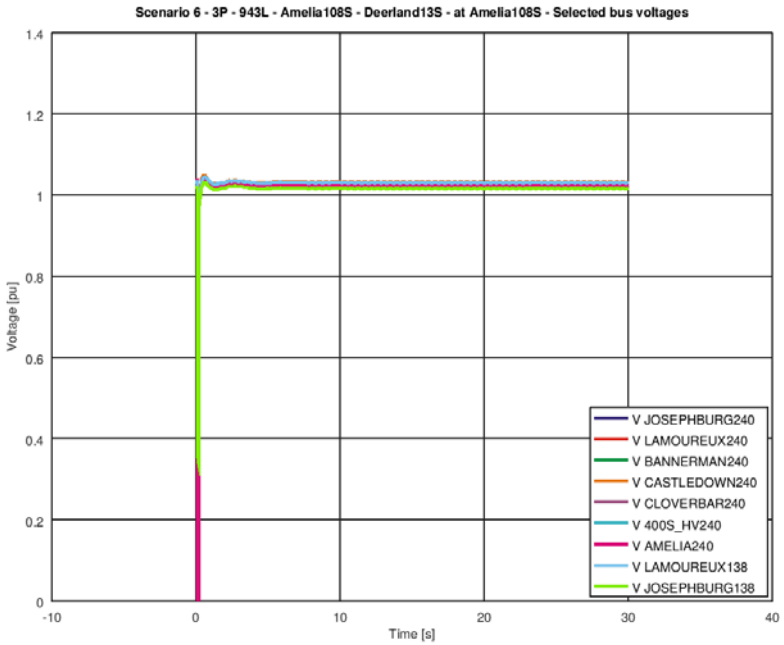


Figure A-146 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

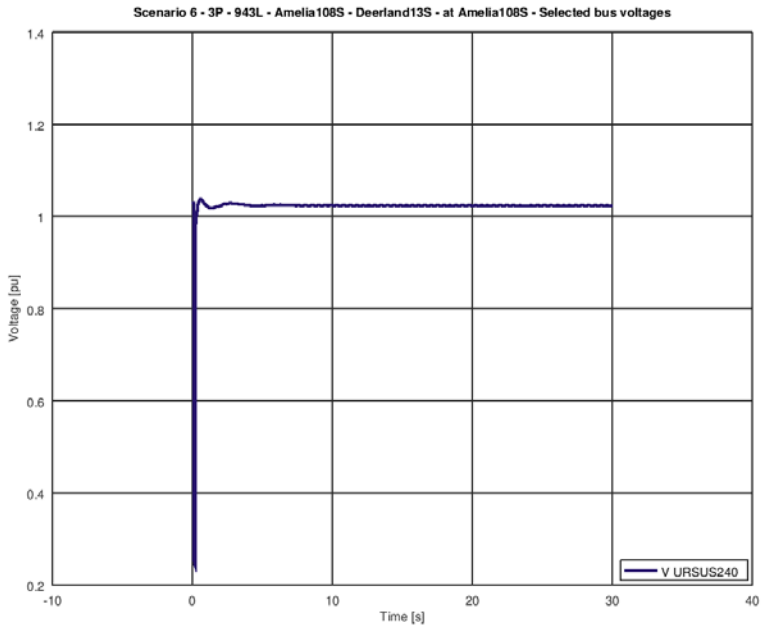


Figure A-147 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

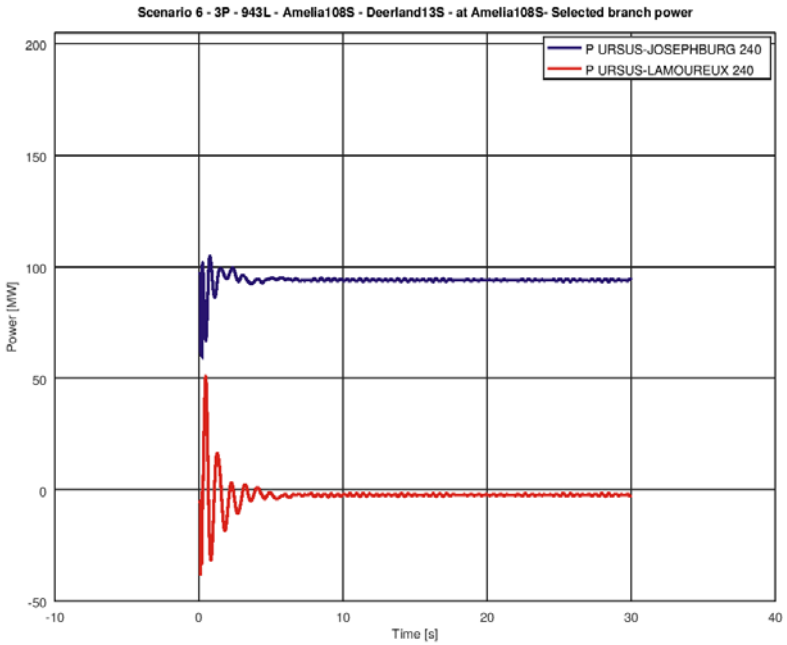


Figure A-148 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

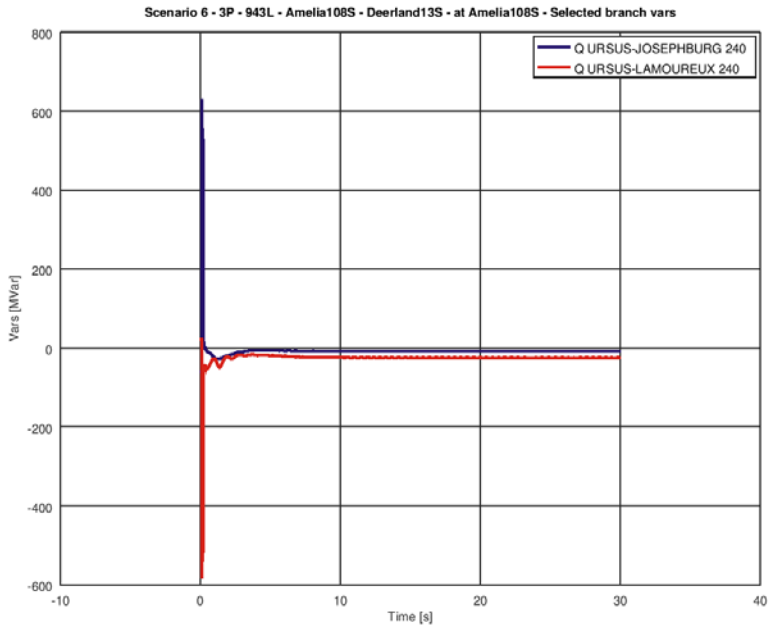


Figure A-149 Scenario 6 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

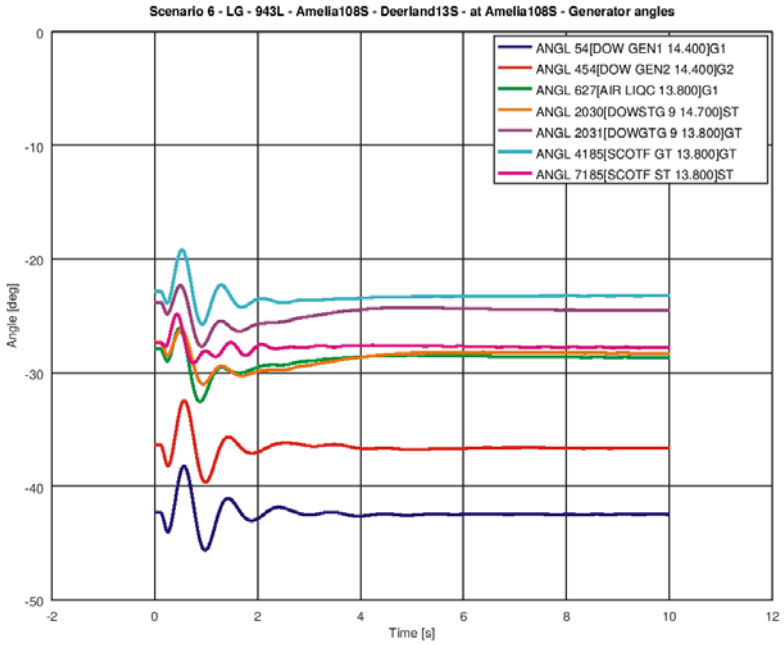


Figure A-150 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

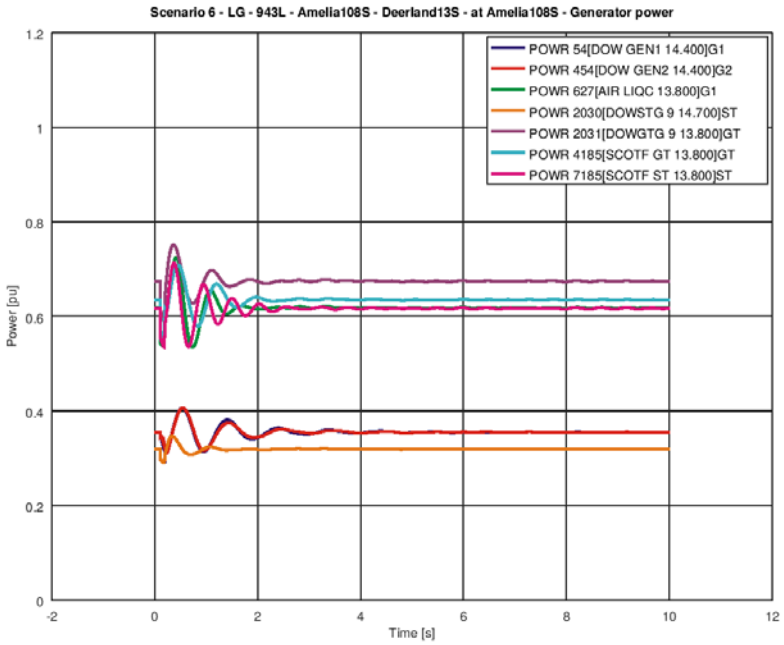


Figure A-151 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

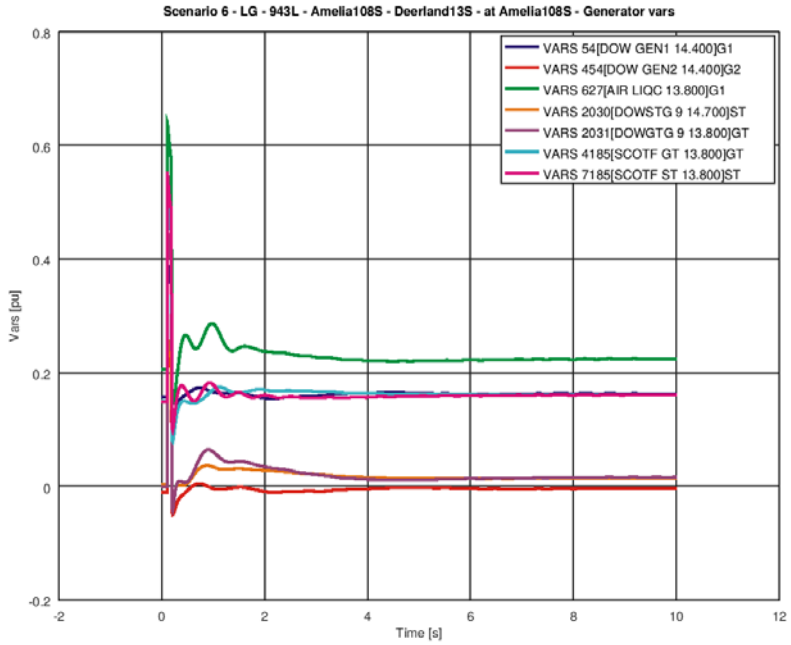


Figure A-152 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

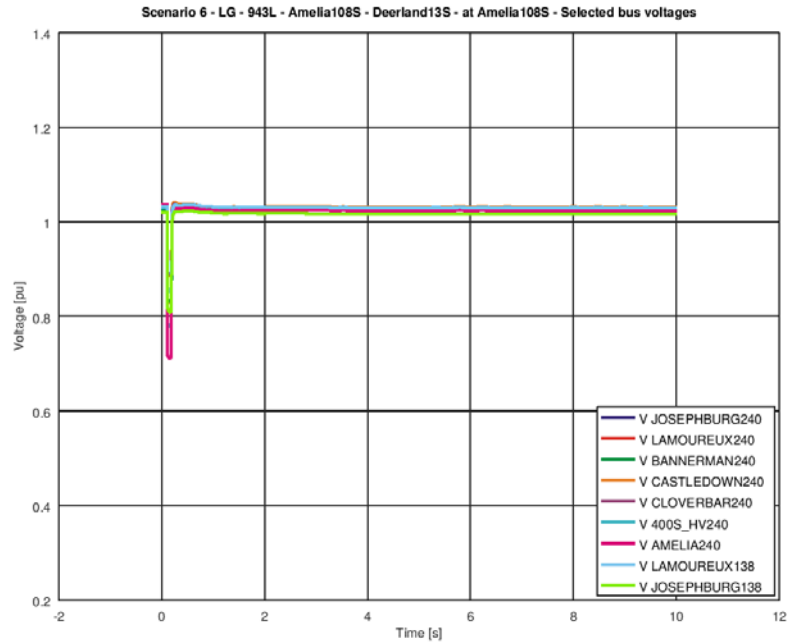


Figure A-153 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

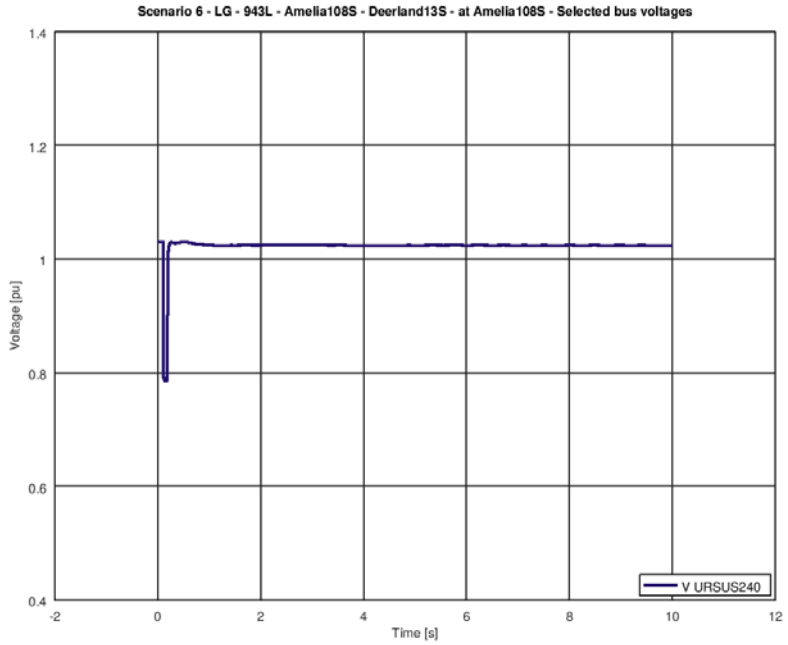


Figure A-154 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

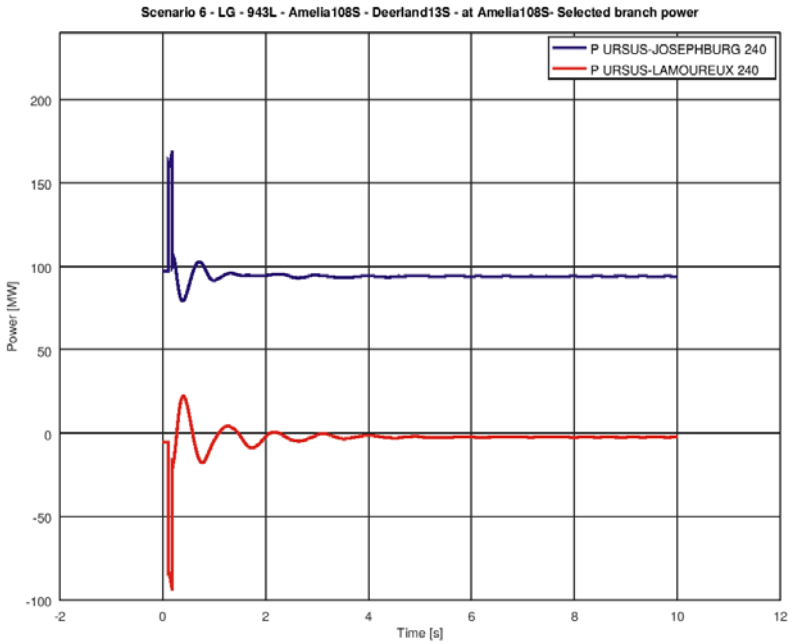


Figure A-155 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

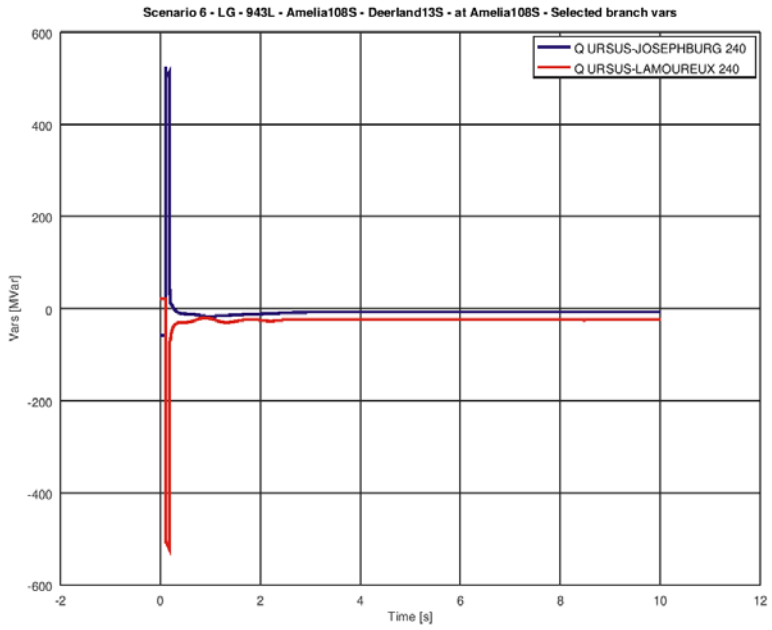


Figure A-156 Scenario 6 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

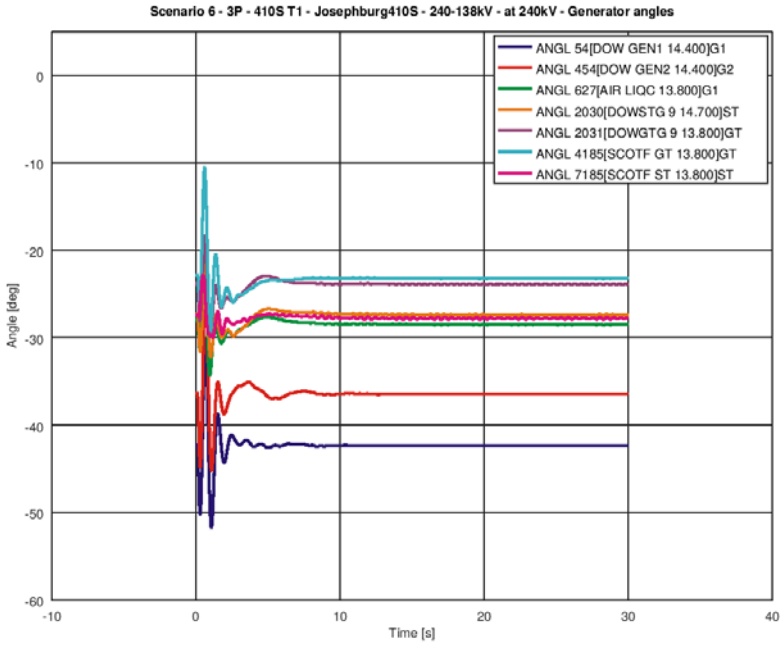


Figure A-157 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

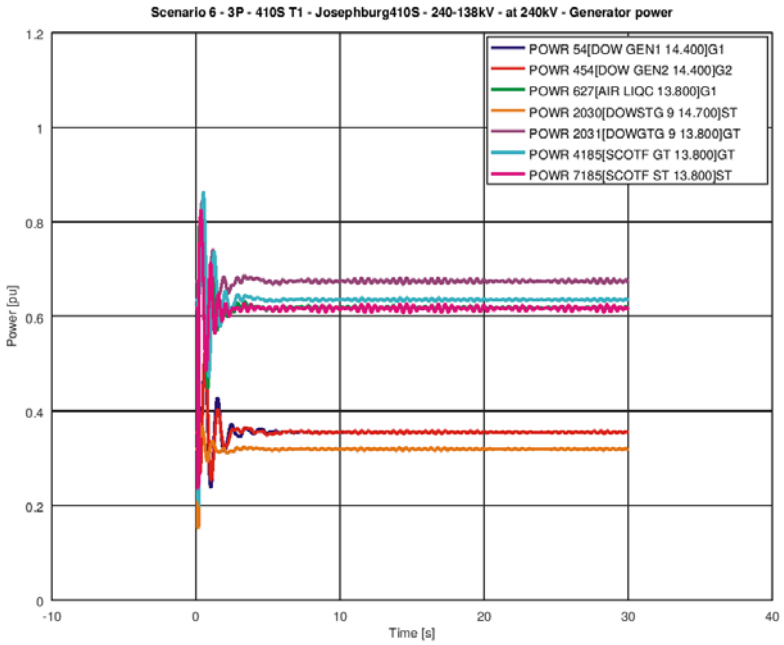


Figure A-158 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

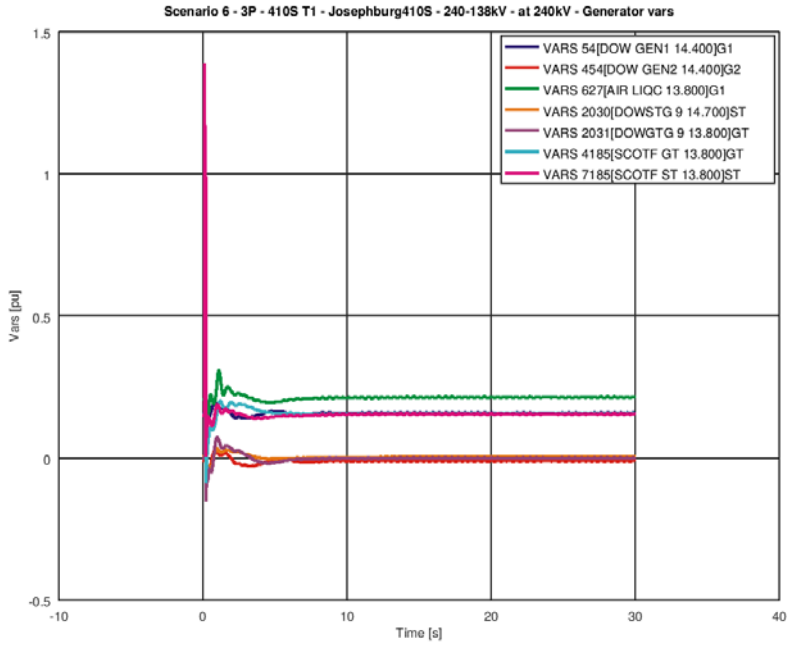


Figure A-159 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

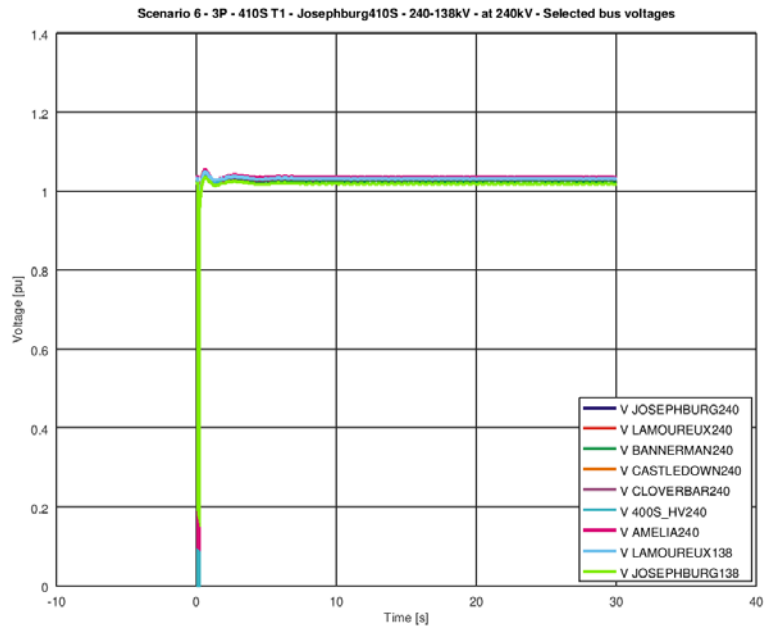


Figure A-160 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

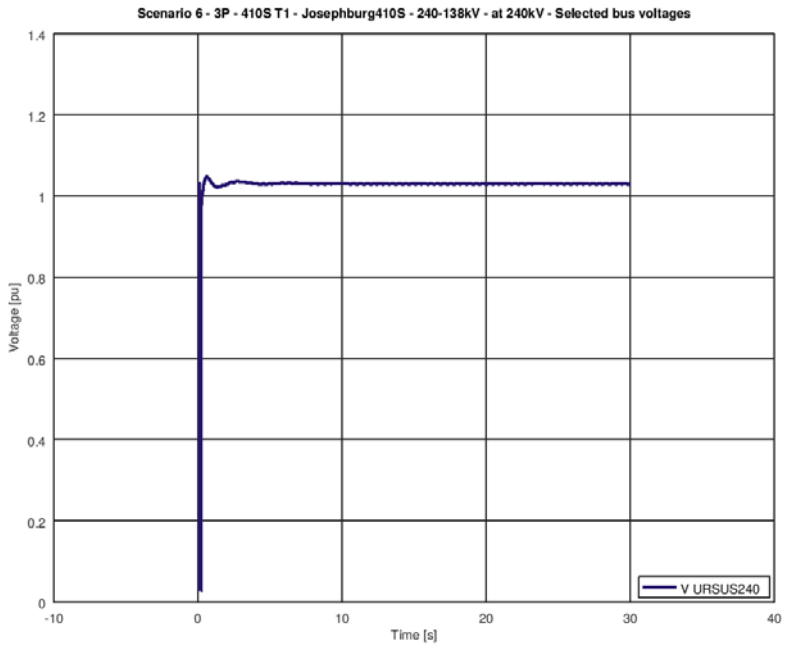


Figure A-161 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

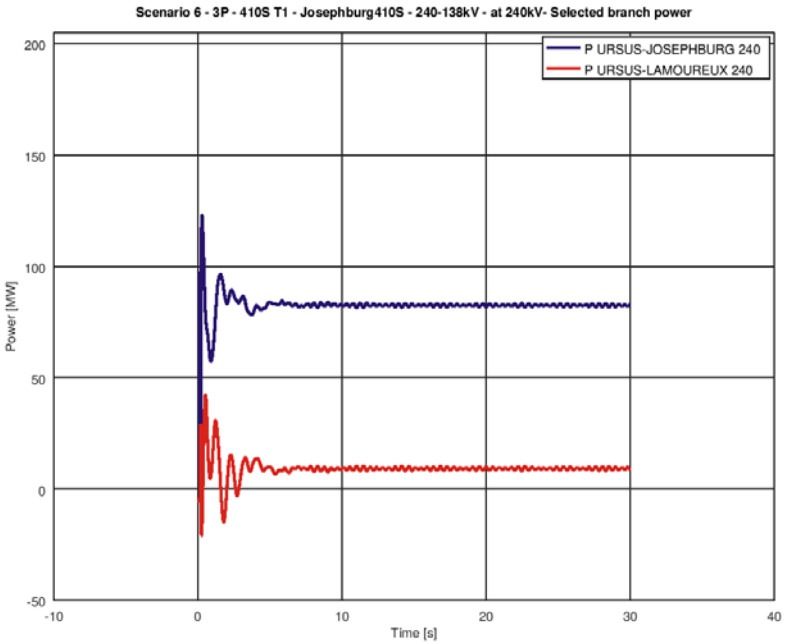


Figure A-162 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch power

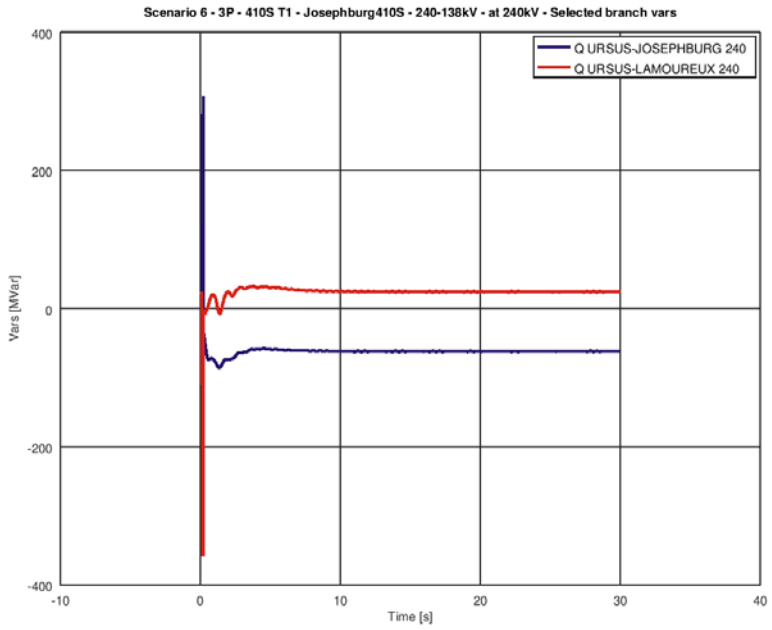


Figure A-163 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch vars

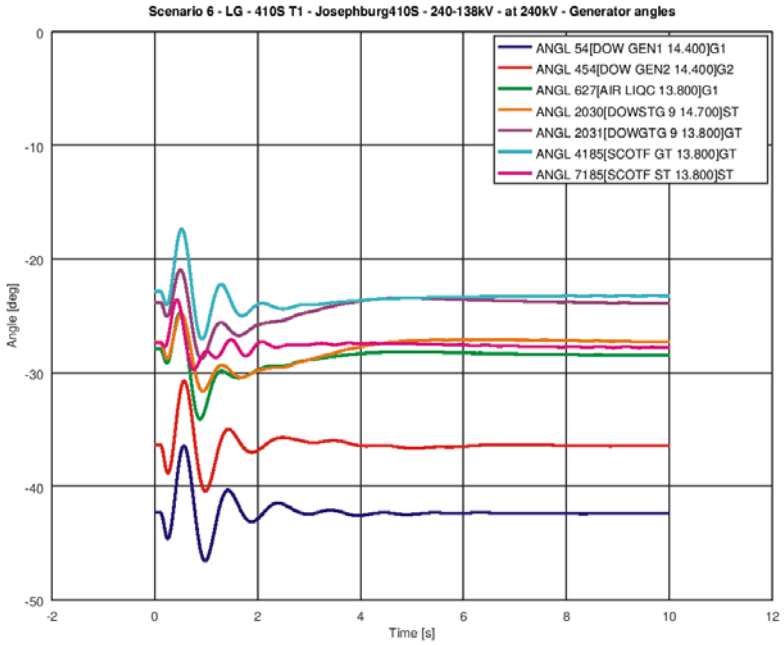


Figure A-164 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

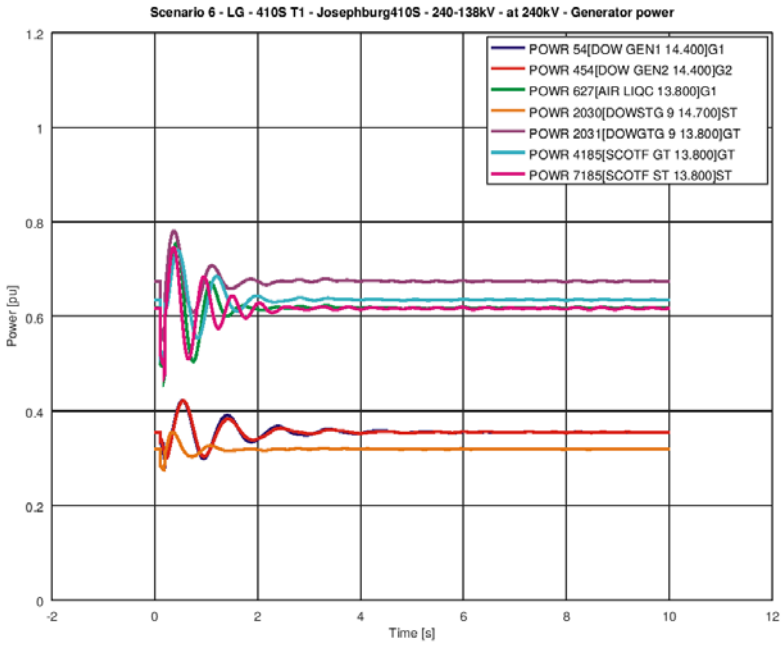


Figure A-165 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

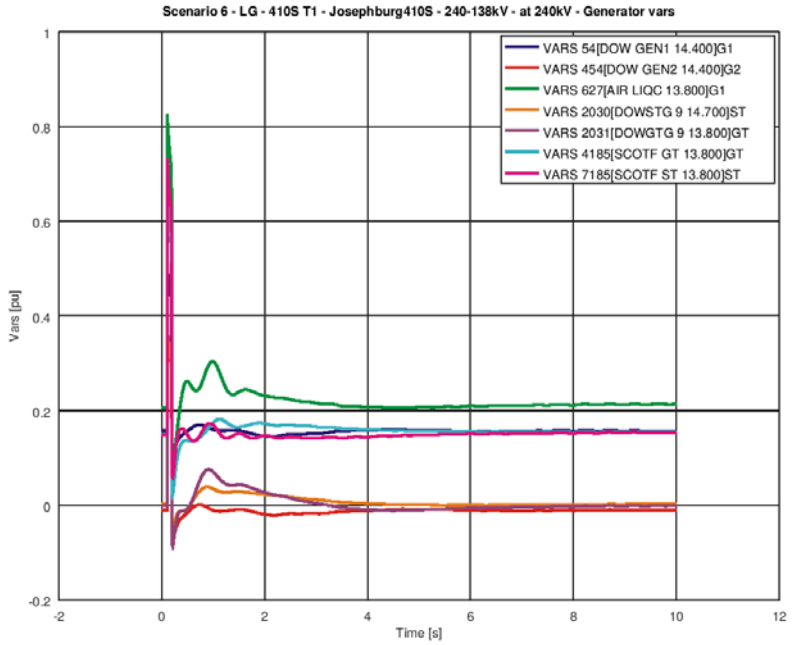


Figure A-166 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

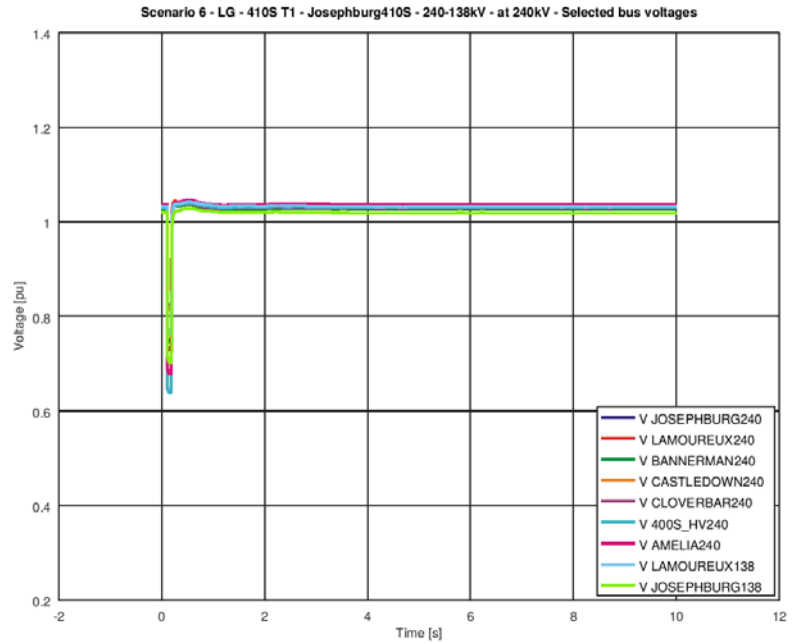


Figure A-167 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

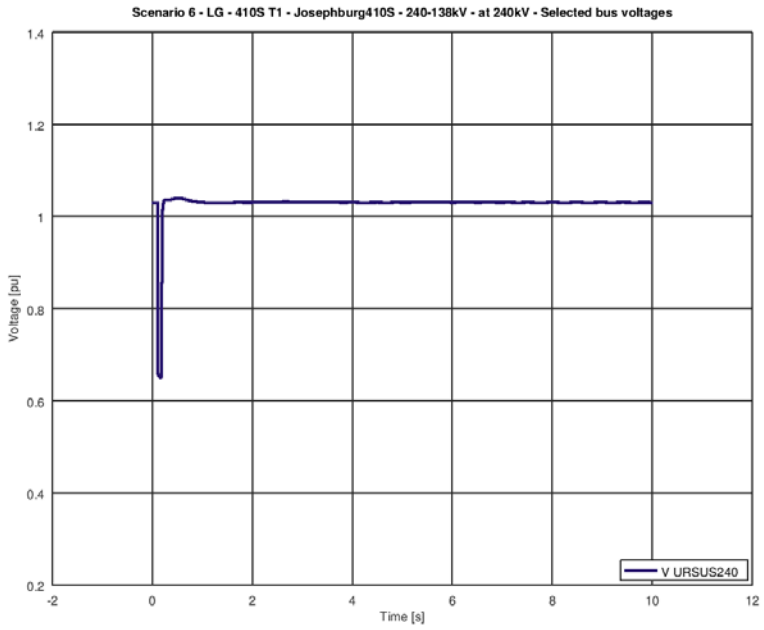


Figure A-168 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

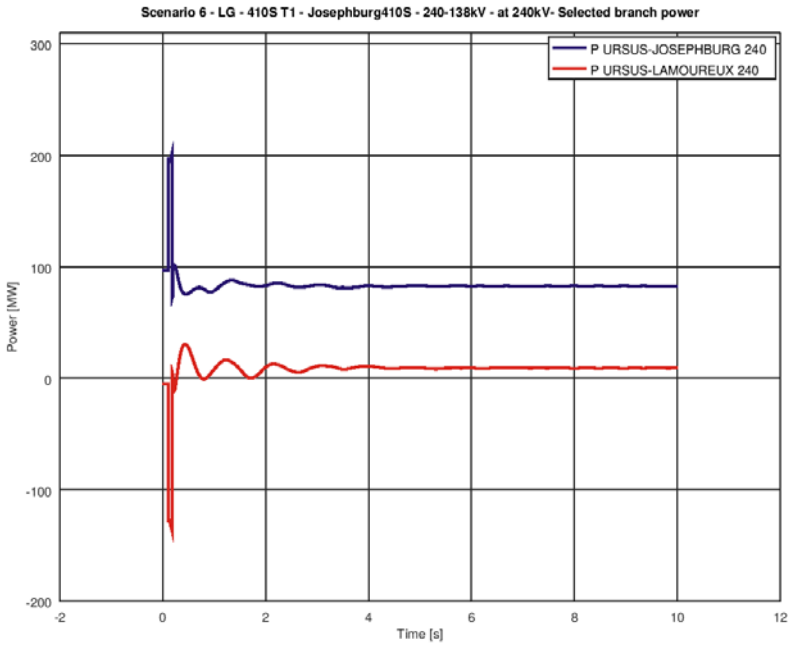


Figure A-169 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch power

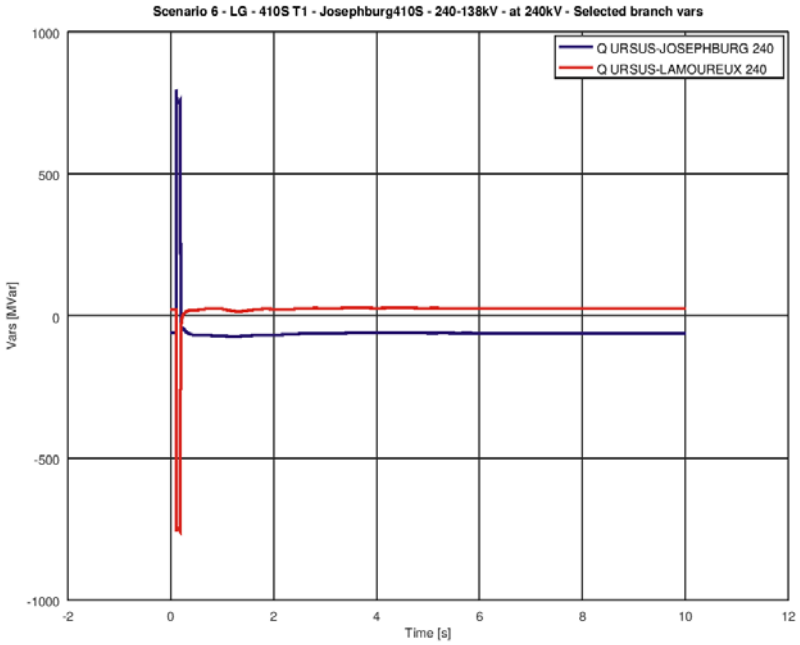


Figure A-170 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch vars

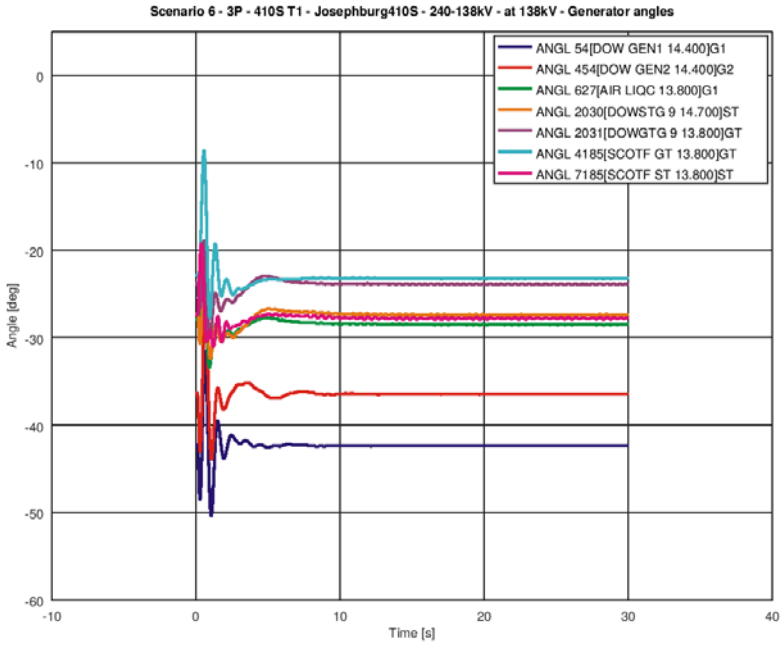


Figure A-171 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

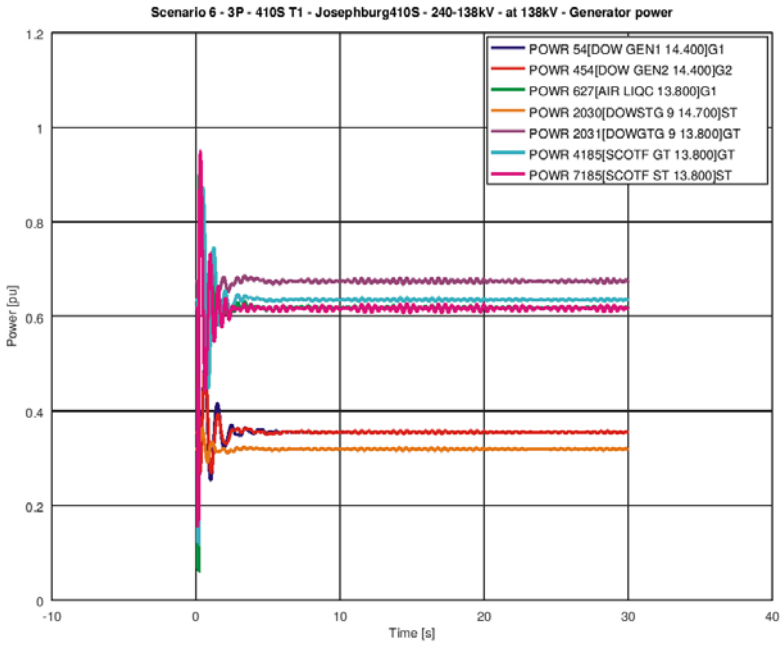


Figure A-172 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

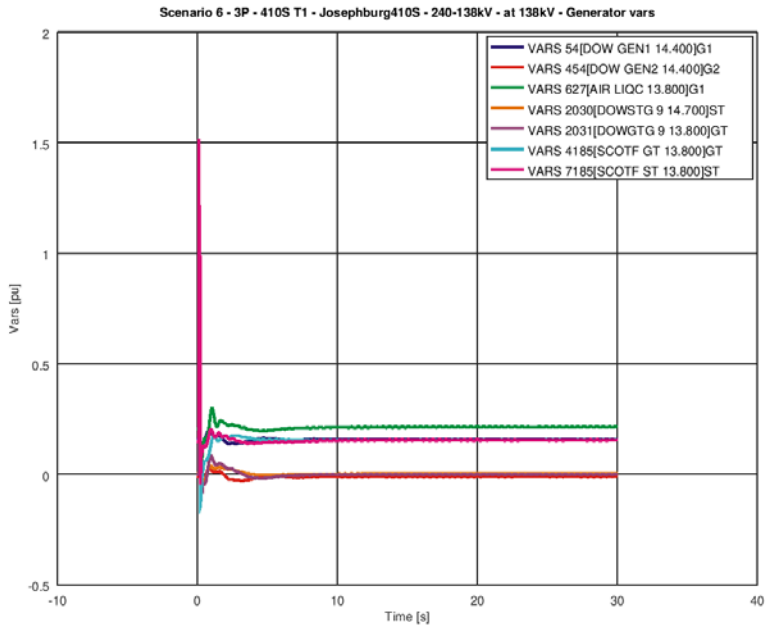


Figure A-173 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

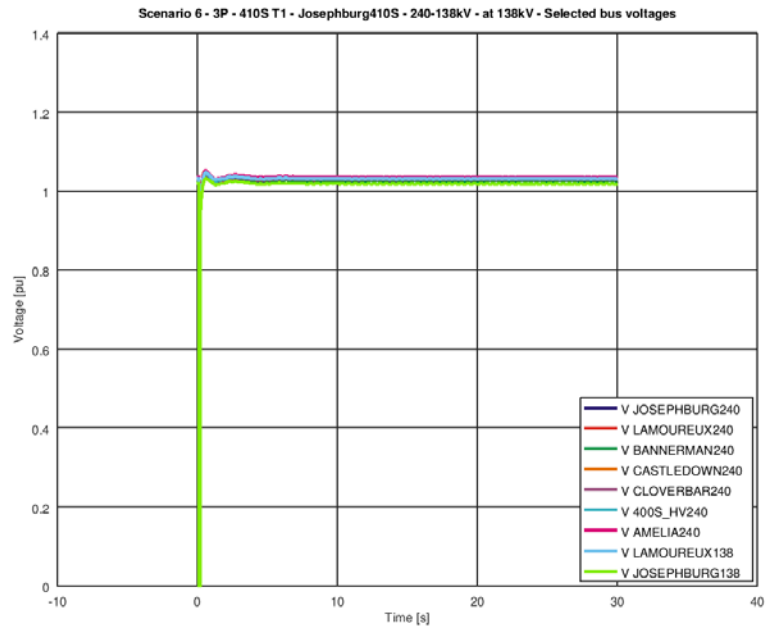


Figure A-174 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

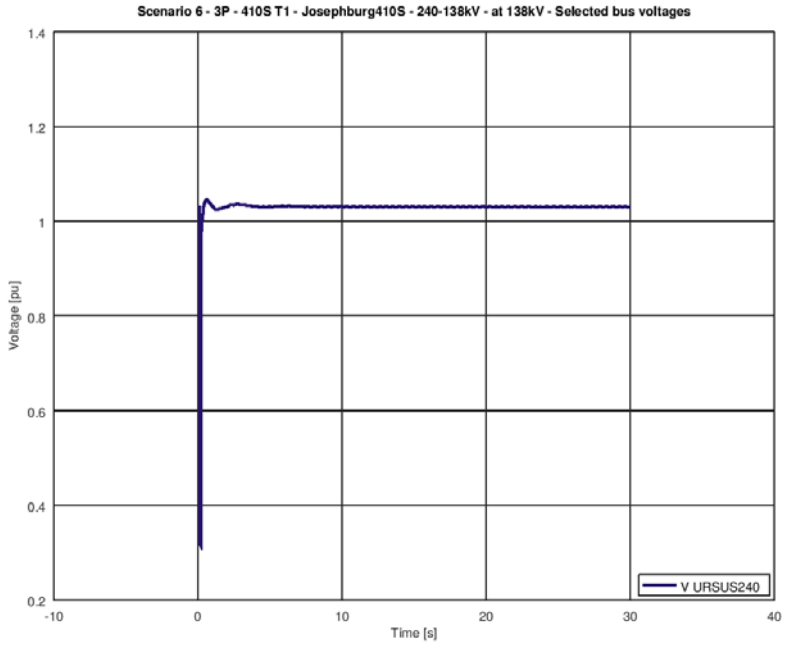


Figure A-175 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

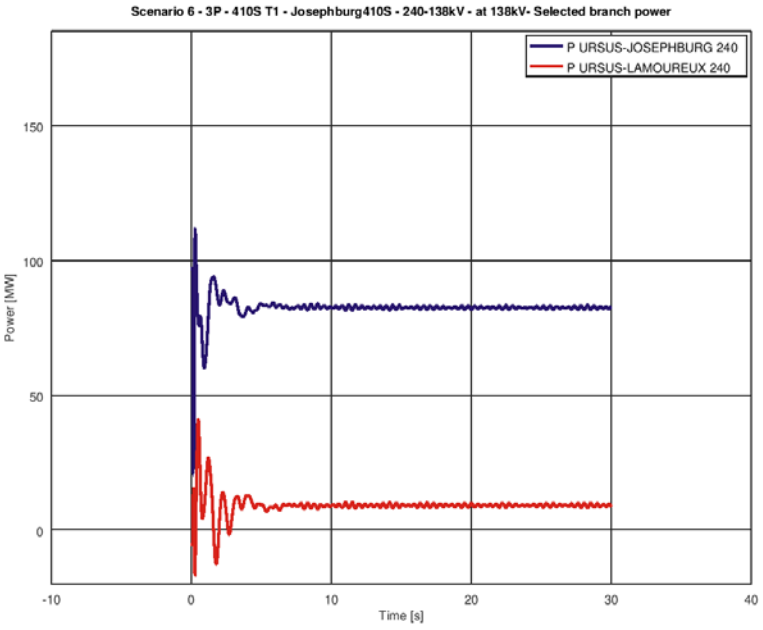


Figure A-176 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch power

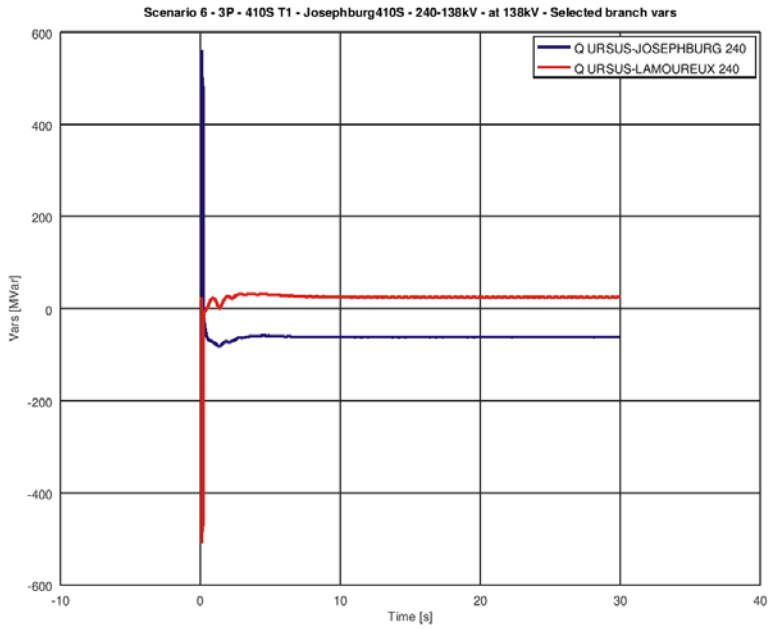


Figure A-177 Scenario 6 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch vars

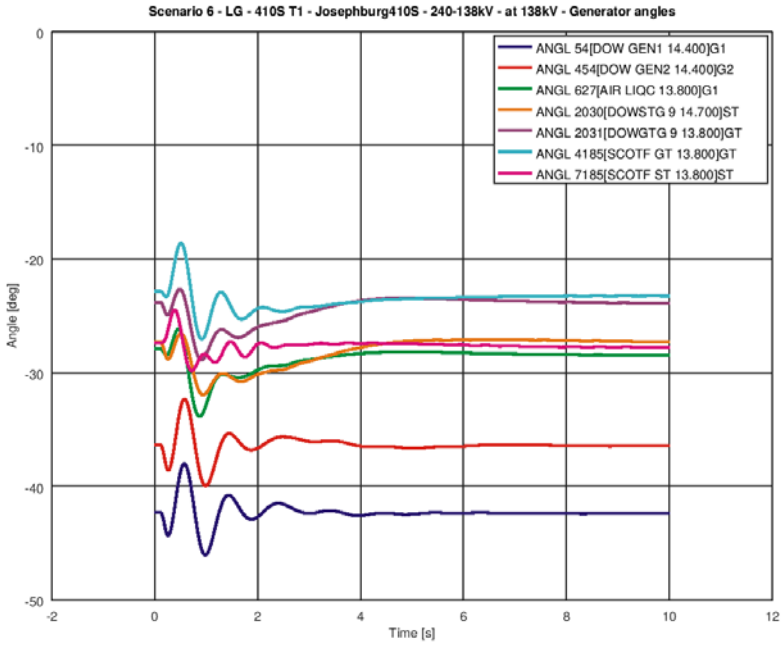


Figure A-178 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

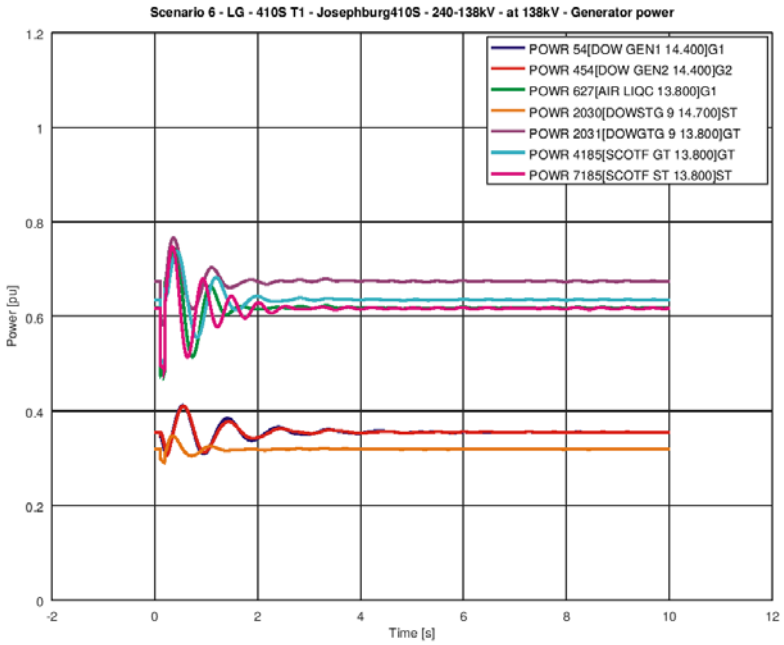


Figure A-179 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

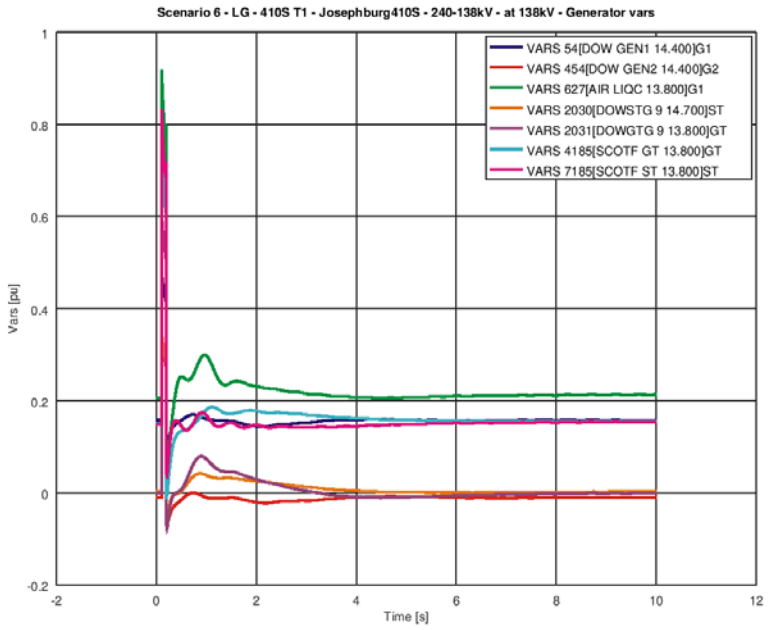


Figure A-180 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

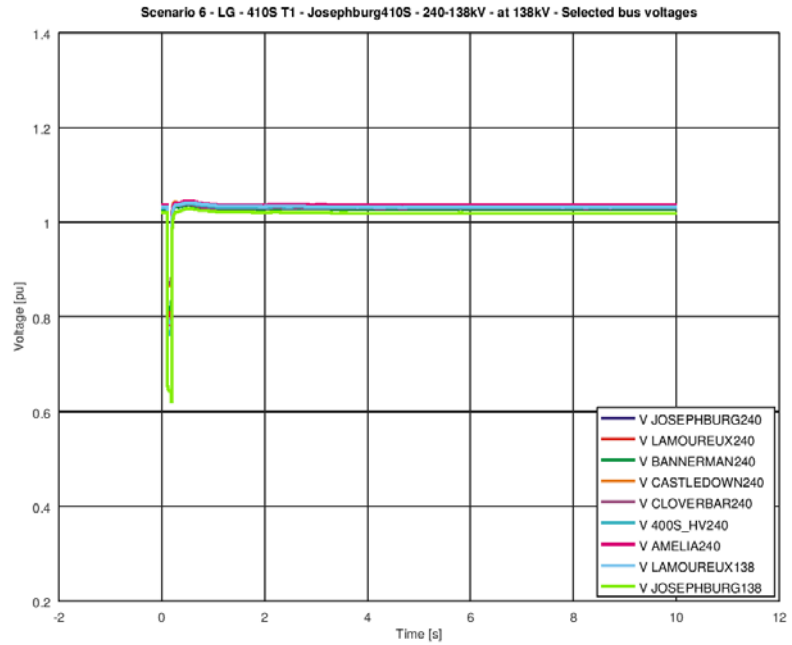


Figure A-181 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

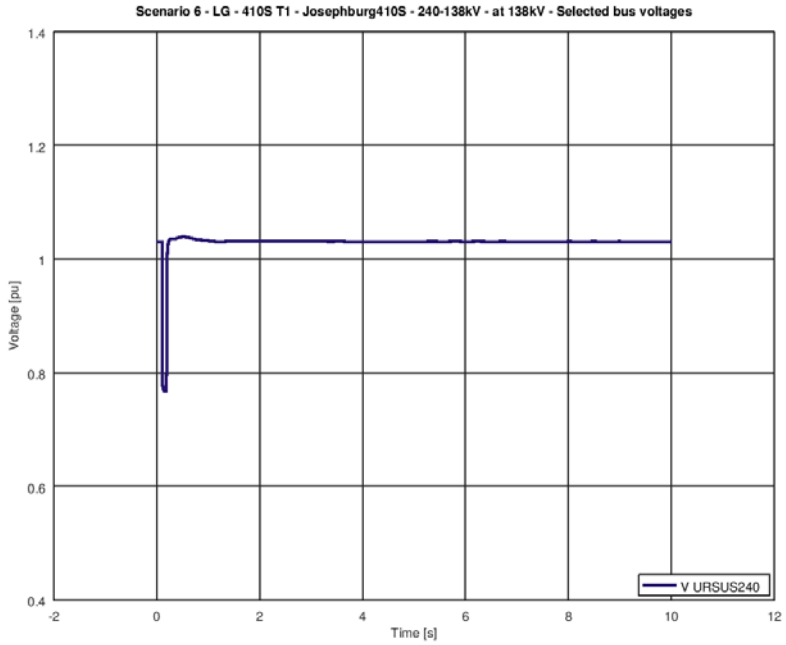


Figure A-182 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

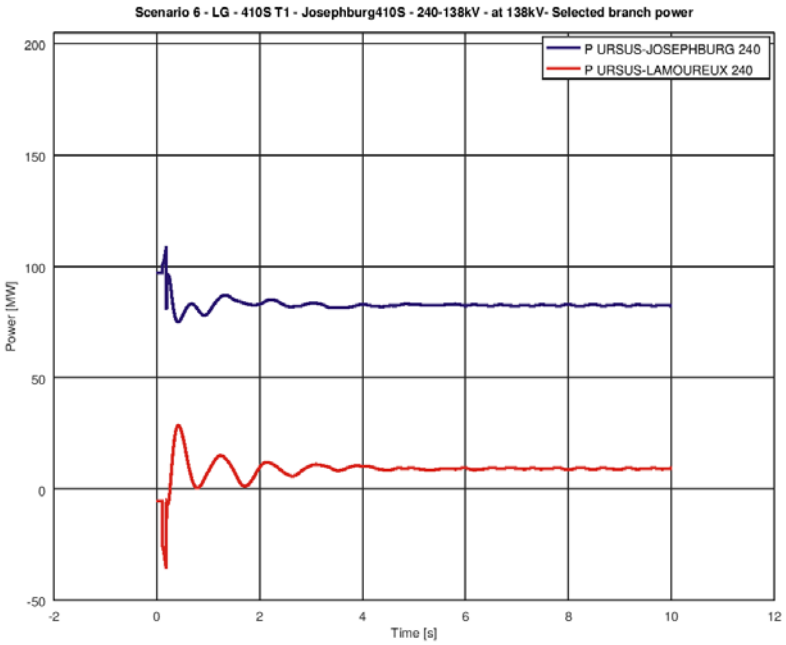


Figure A-183 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch power

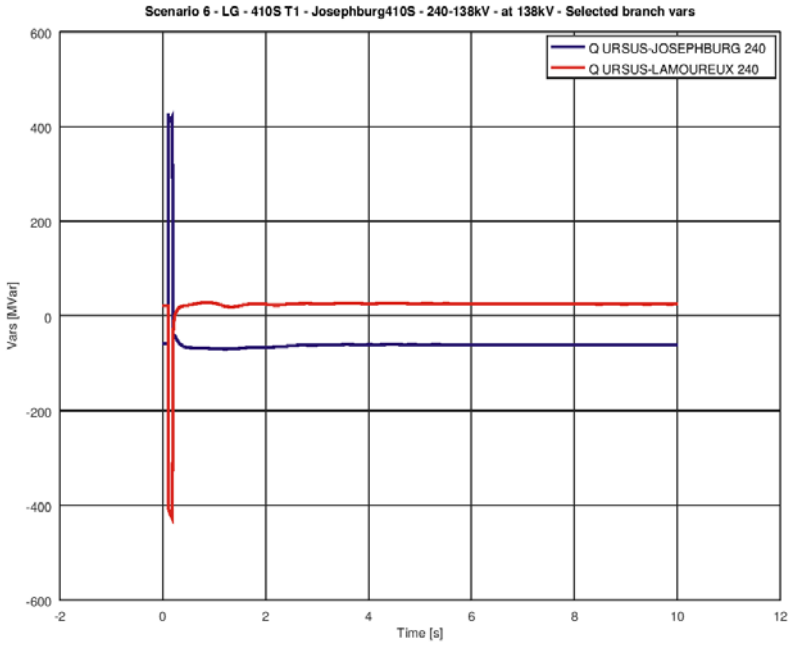


Figure A-184 Scenario 6 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch vars

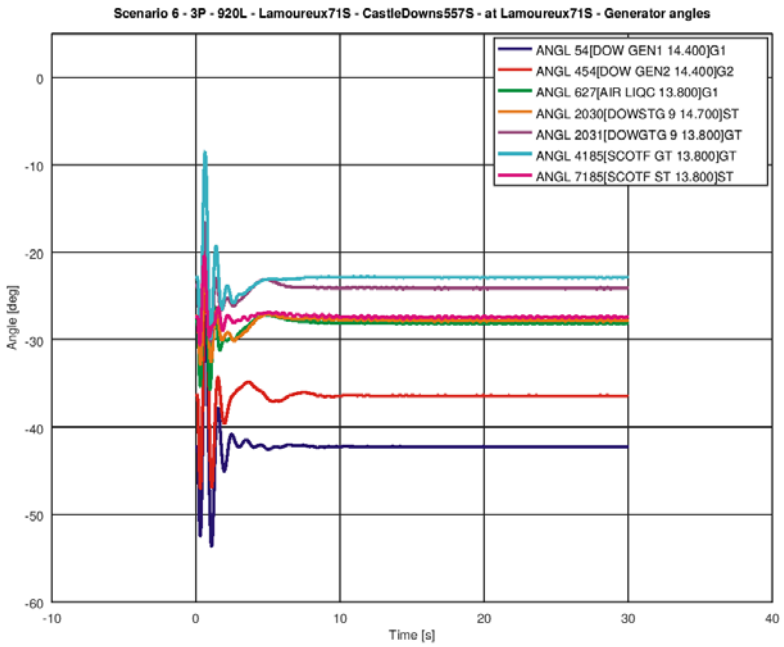


Figure A-185 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

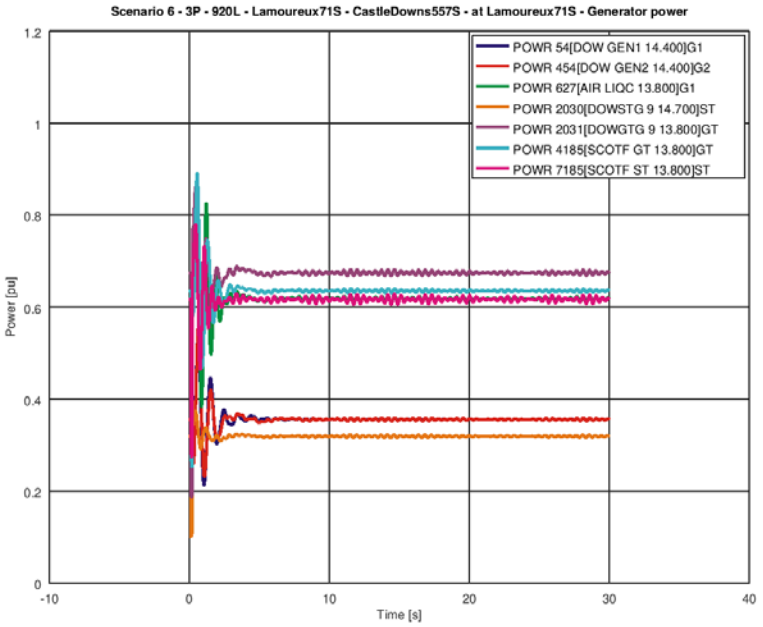


Figure A-186 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

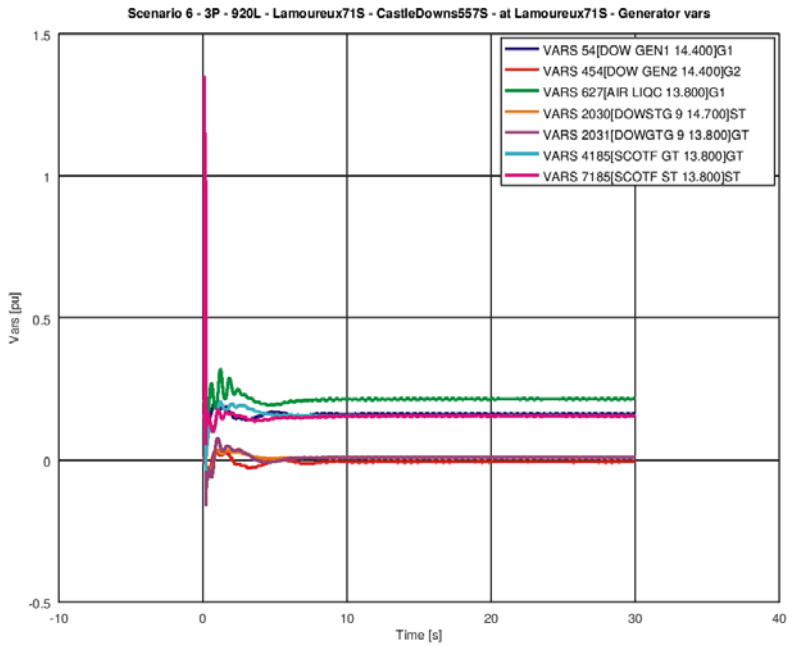


Figure A-187 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

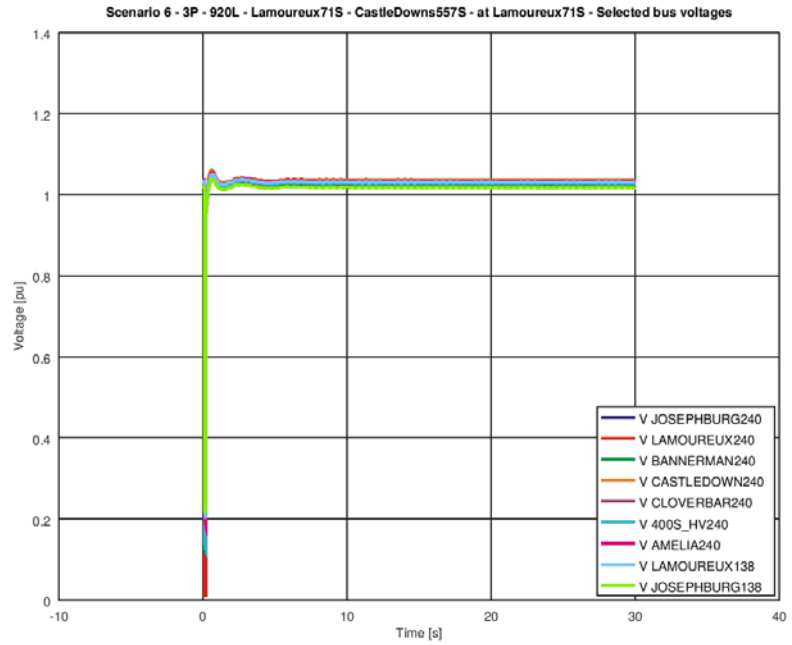


Figure A-188 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

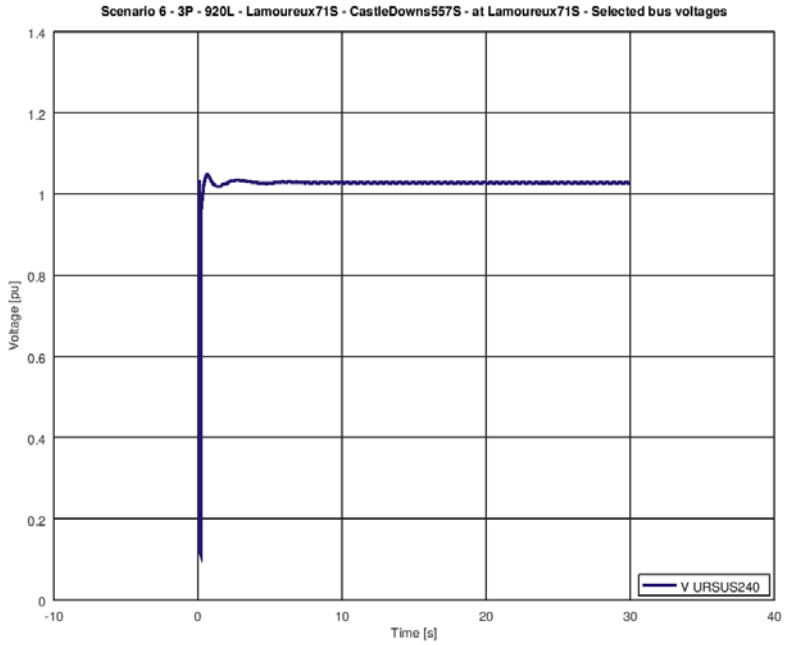


Figure A-189 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

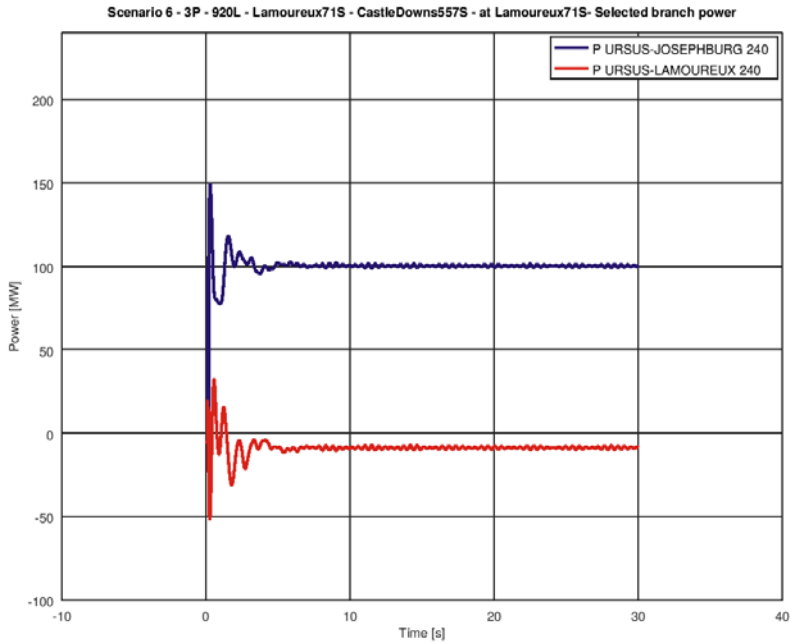


Figure A-190 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

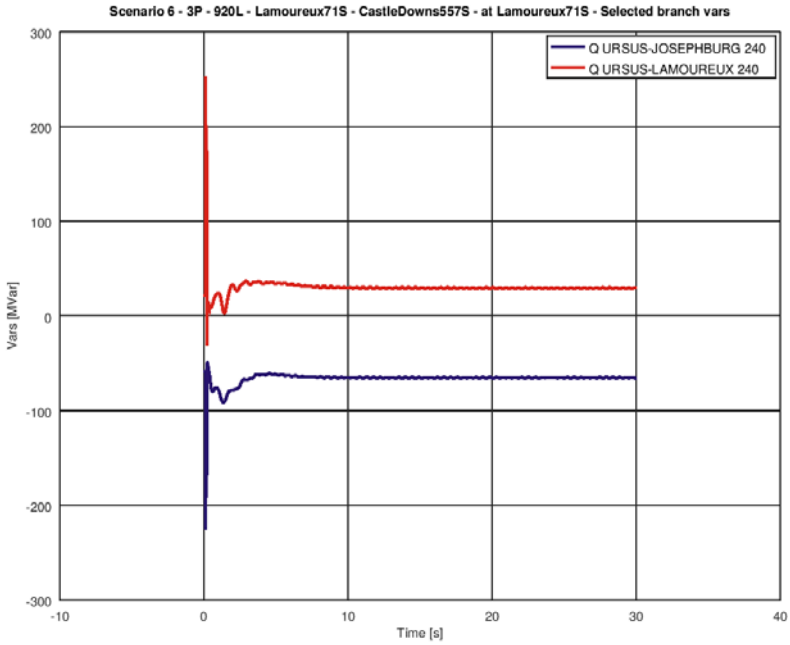


Figure A-191 Scenario 6 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

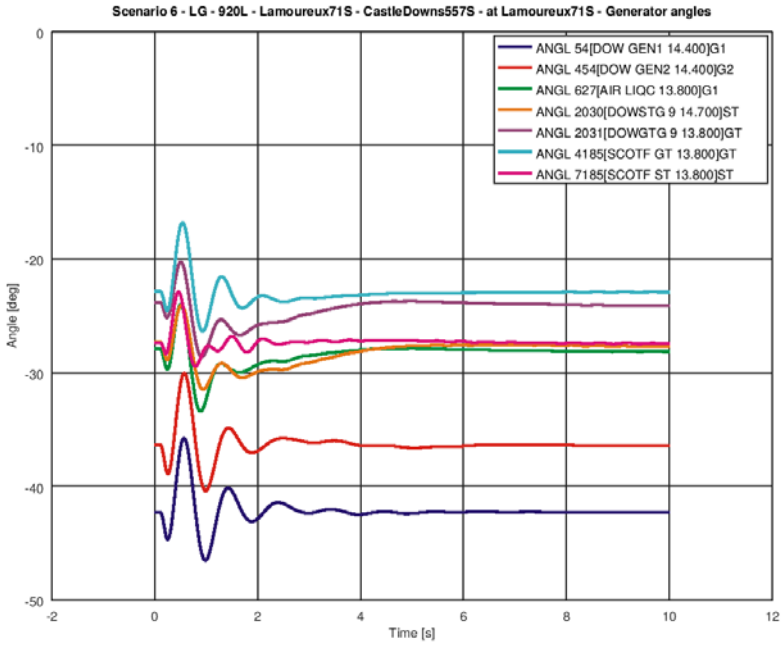


Figure A-192 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

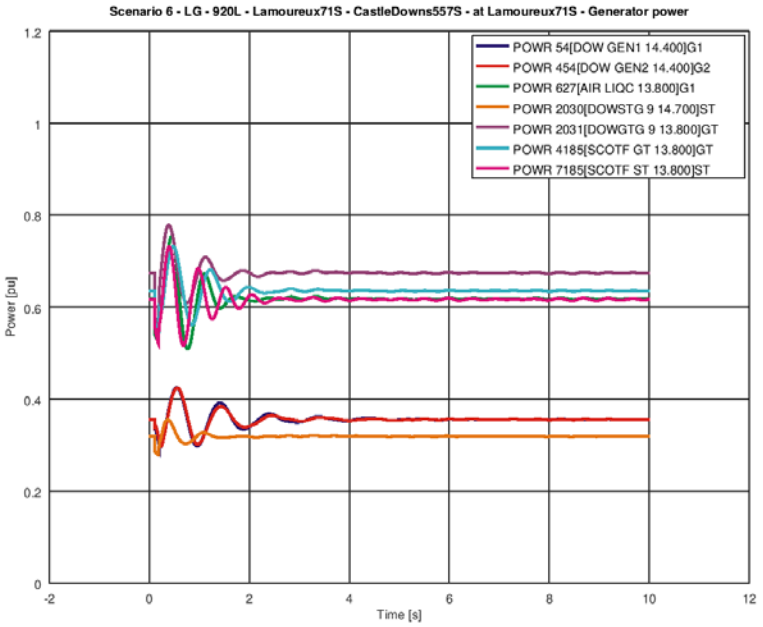


Figure A-193 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

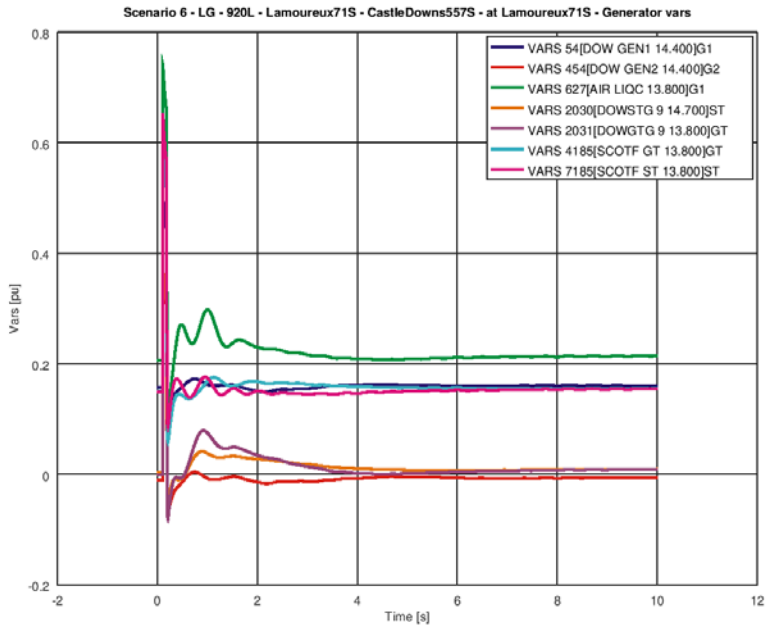


Figure A-194 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

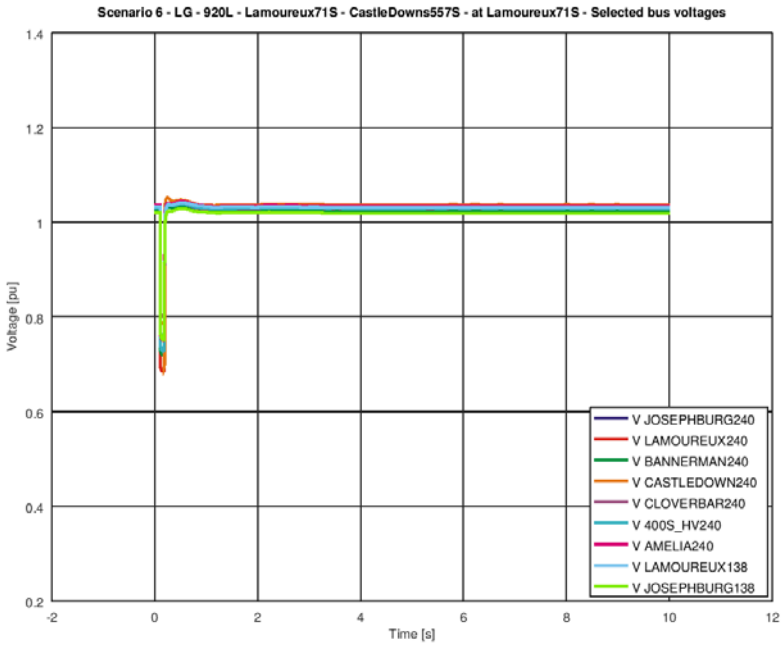


Figure A-195 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

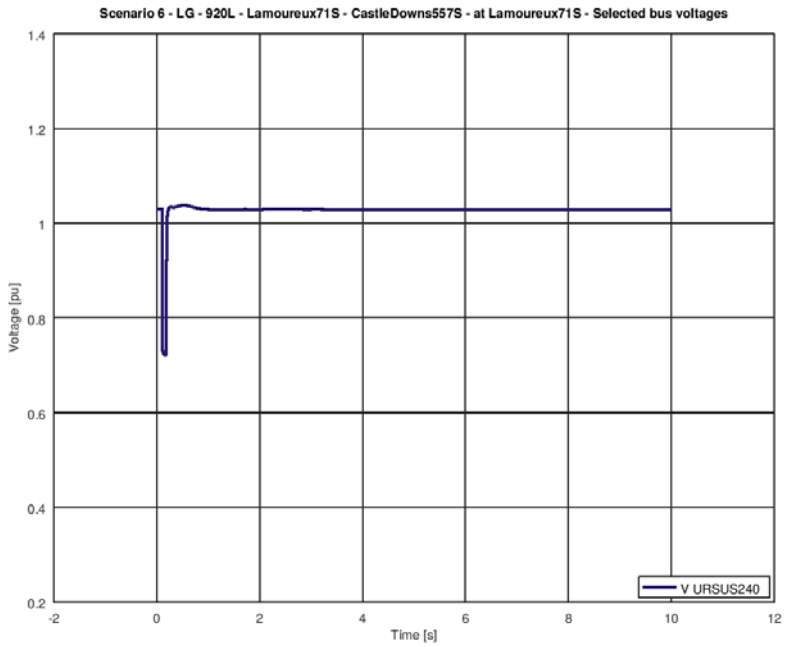


Figure A-196 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

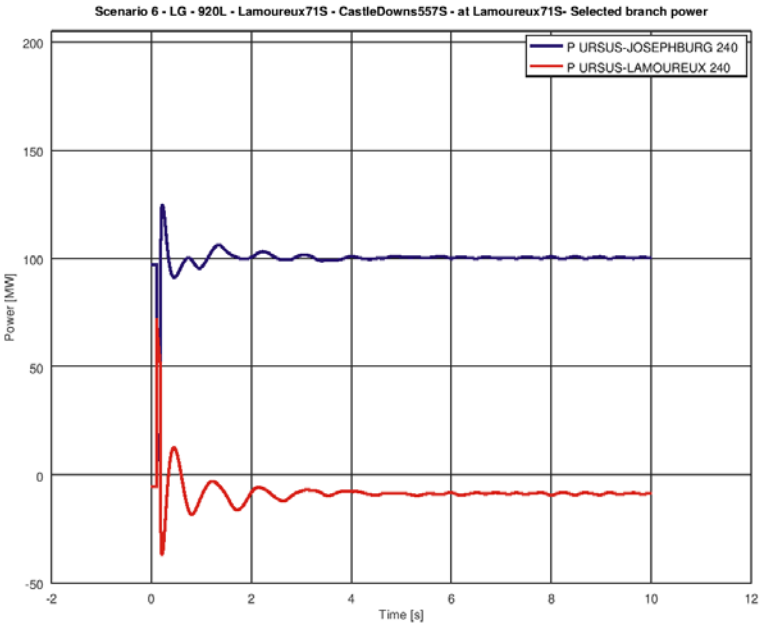


Figure A-197 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

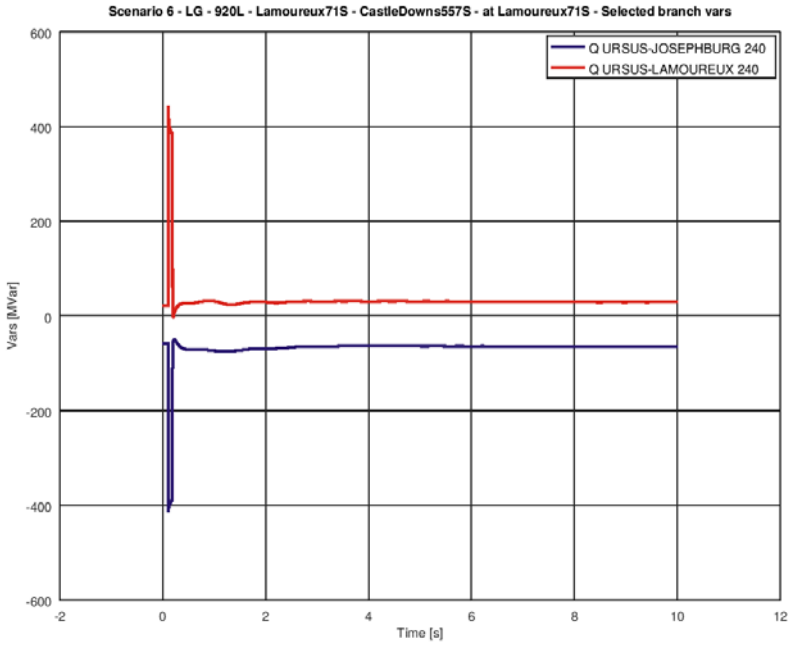


Figure A-198 Scenario 6 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

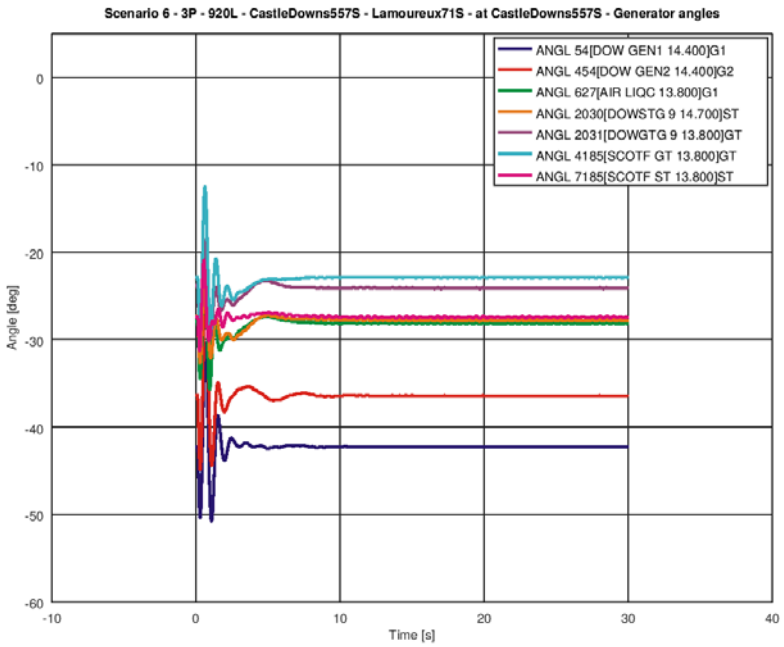


Figure A-199 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

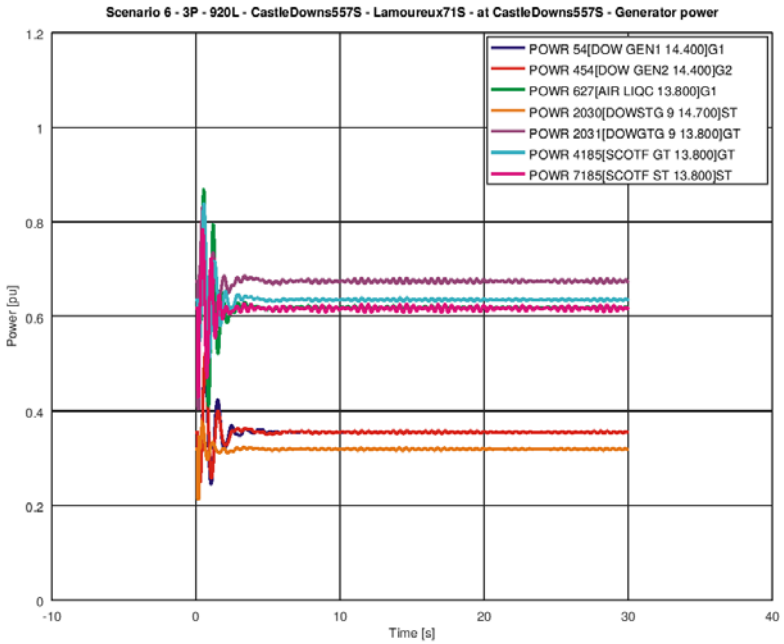


Figure A-200 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

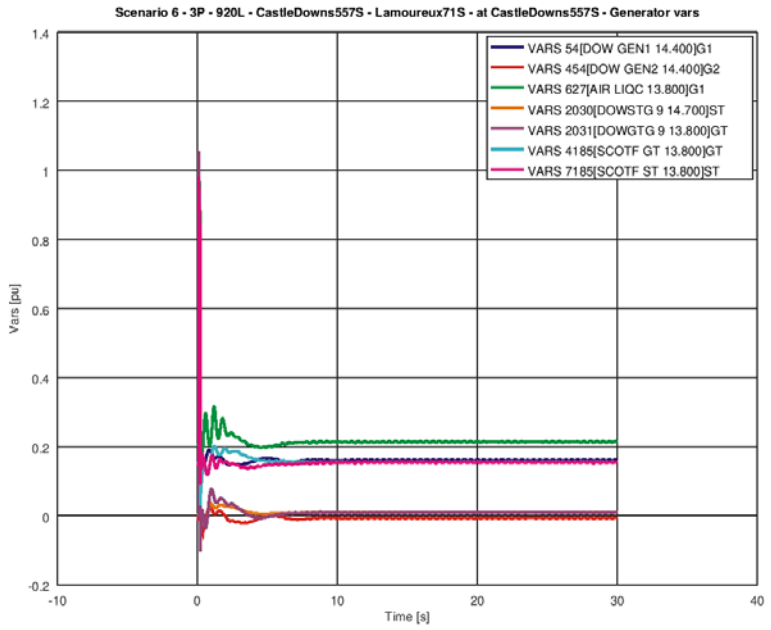


Figure A-201 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

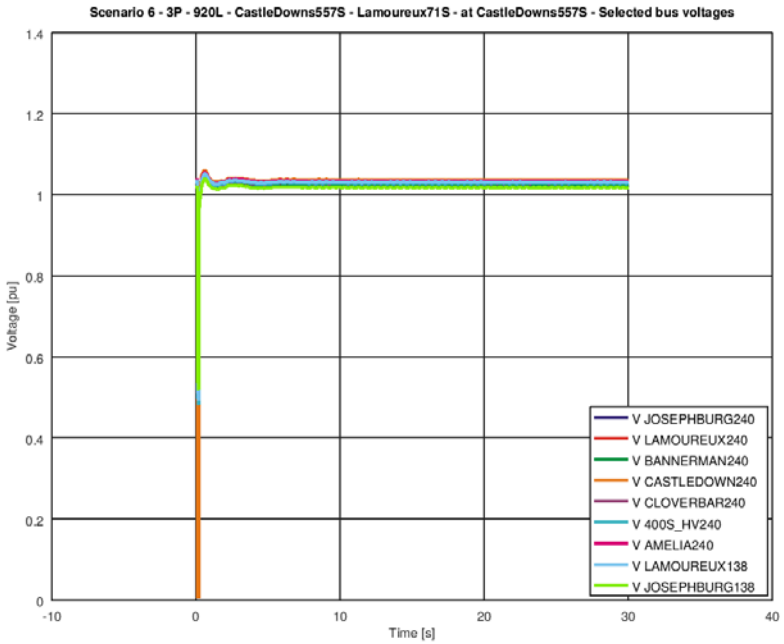


Figure A-202 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

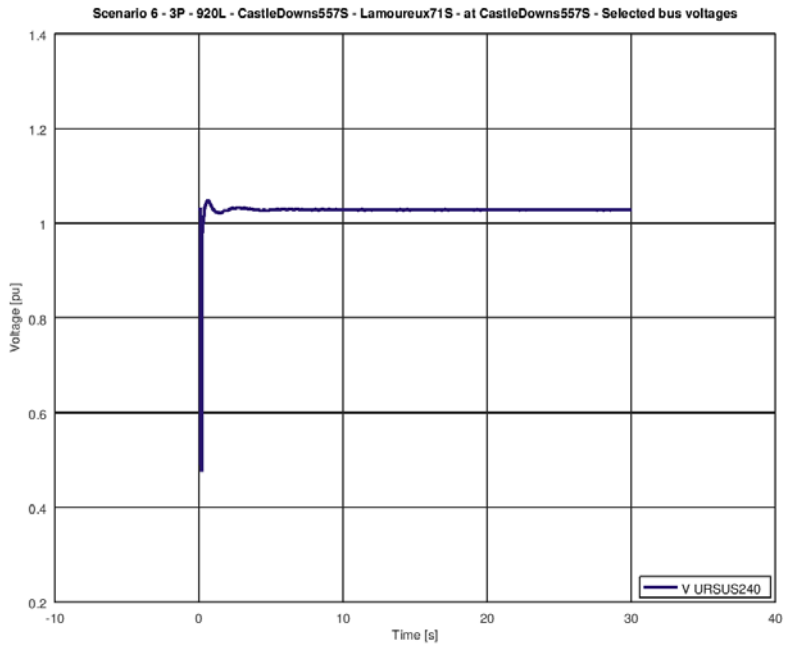


Figure A-203 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

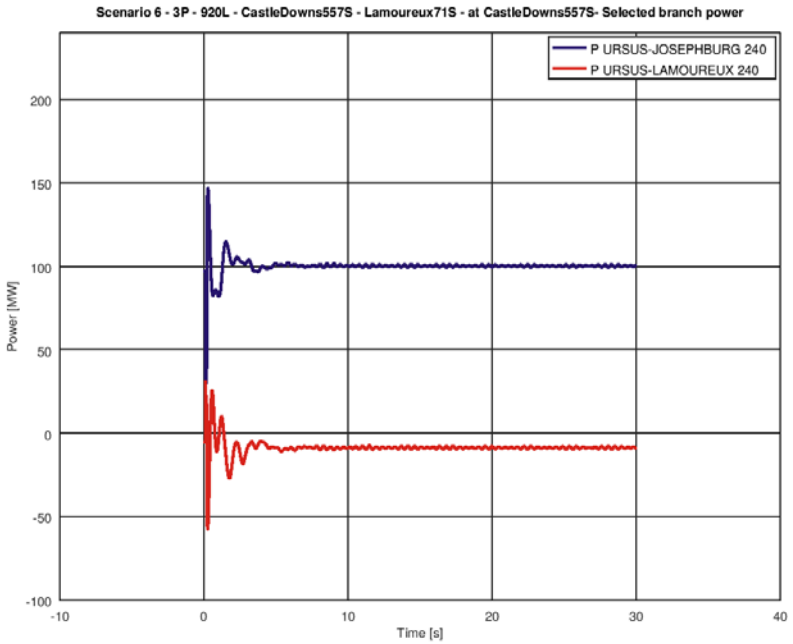


Figure A-204 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

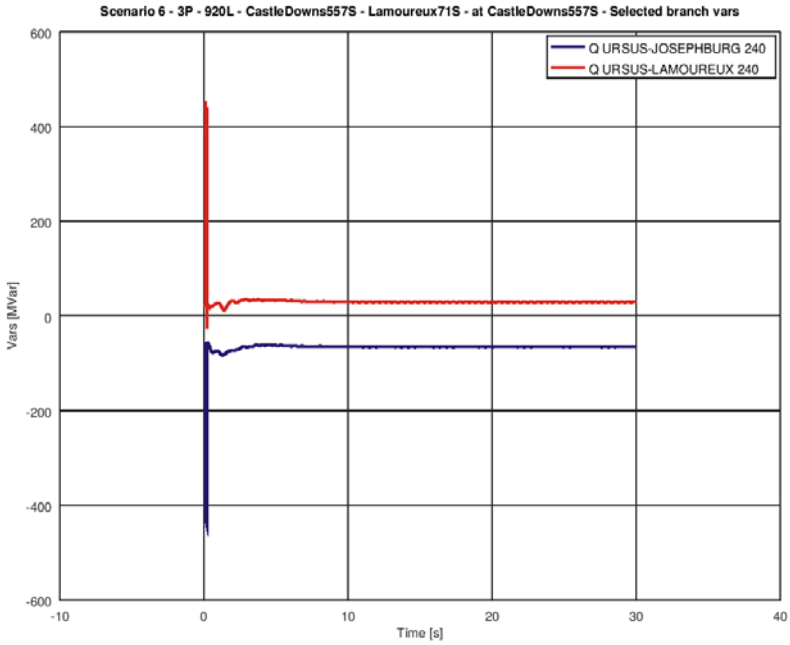


Figure A-205 Scenario 6 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

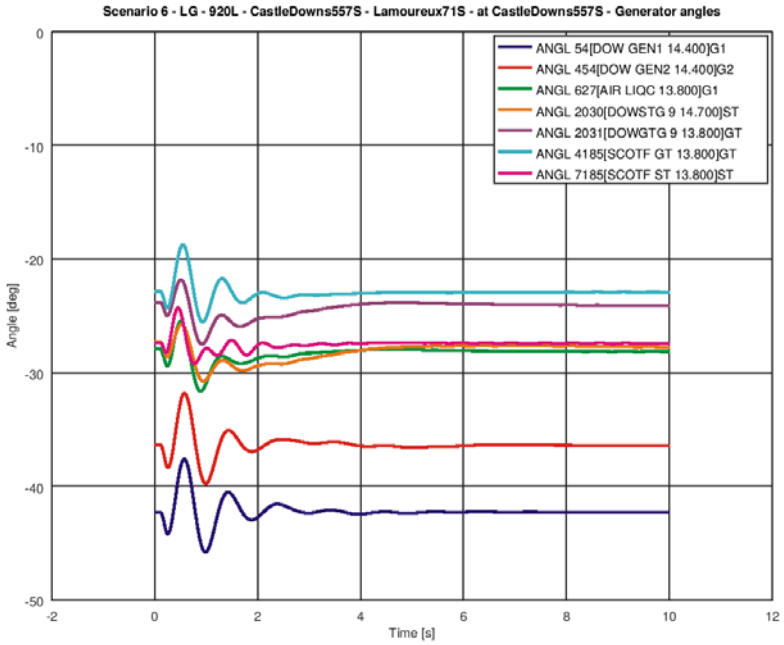


Figure A-206 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

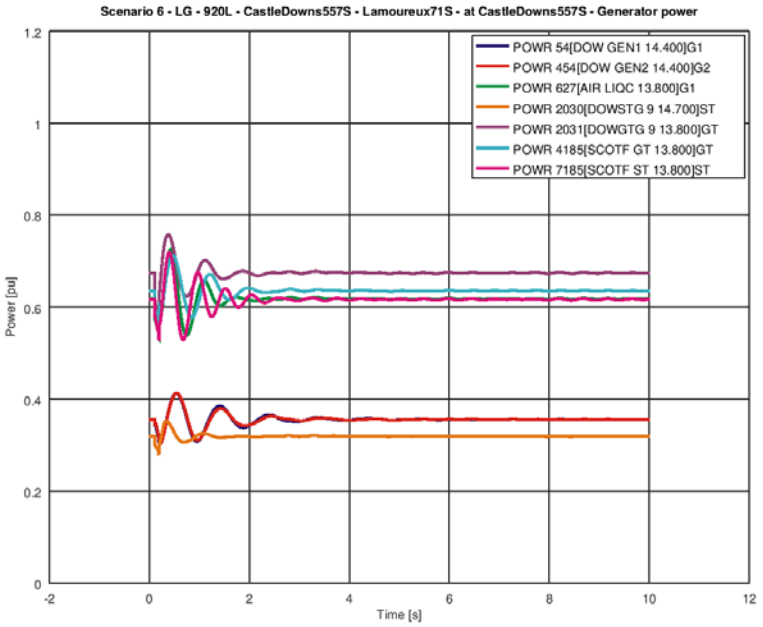


Figure A-207 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

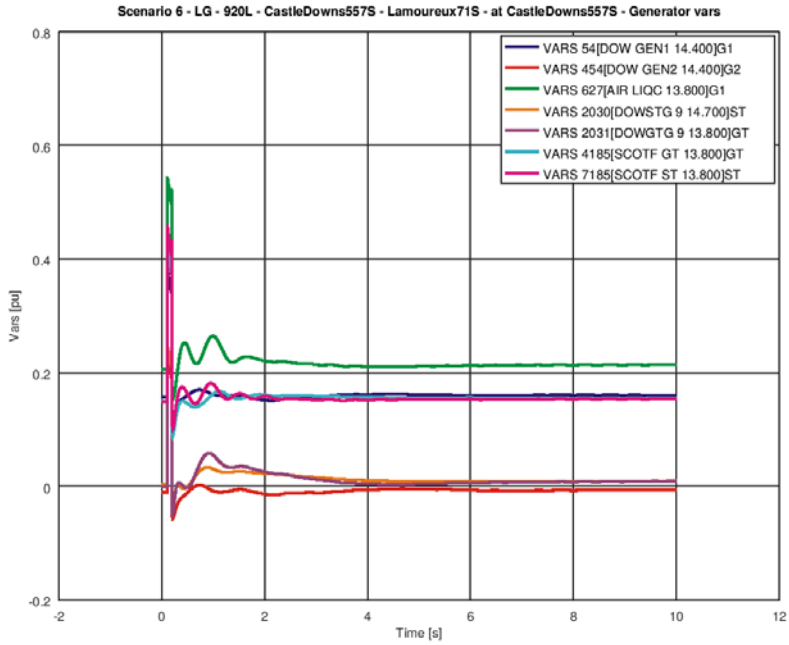


Figure A-208 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

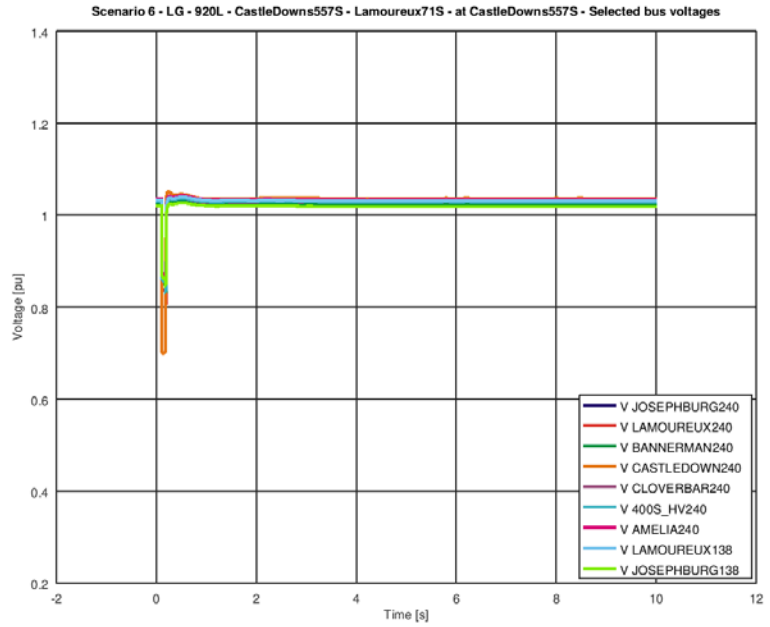


Figure A-209 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

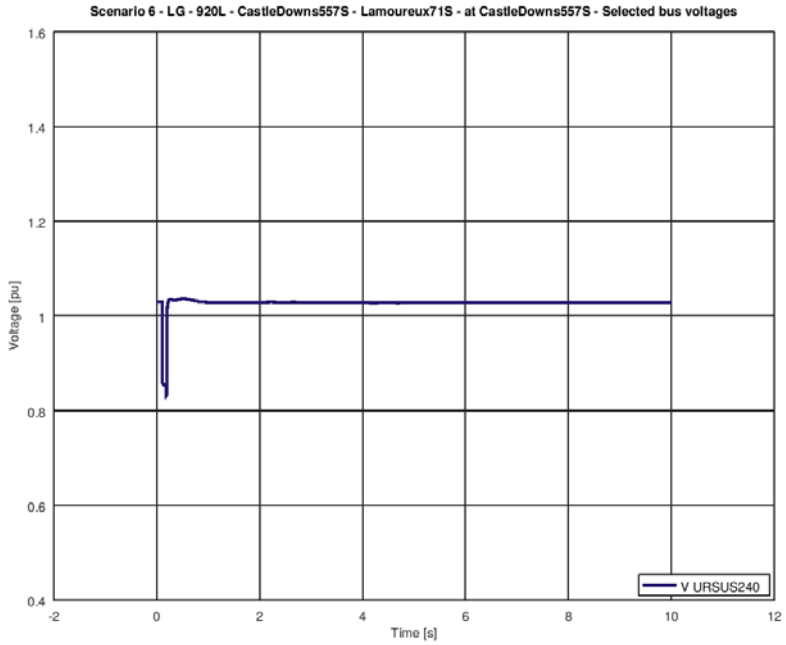


Figure A-210 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

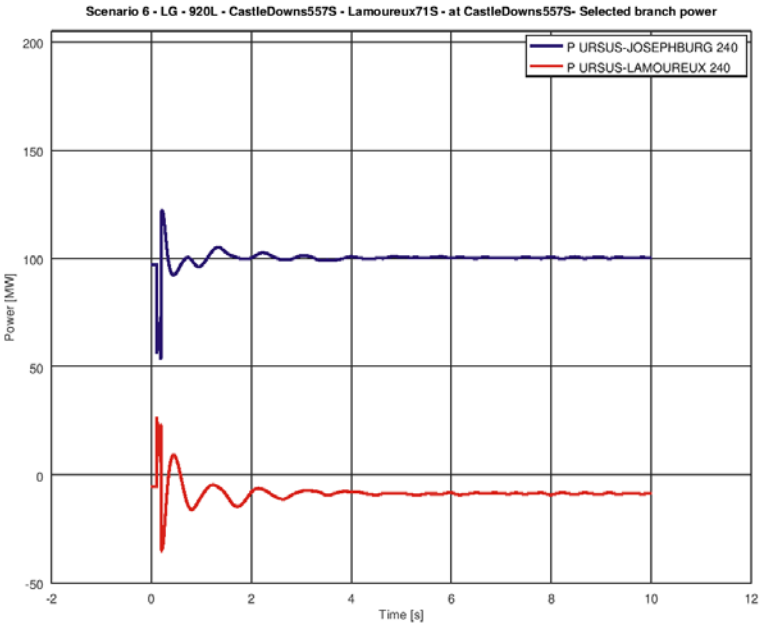


Figure A-211 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

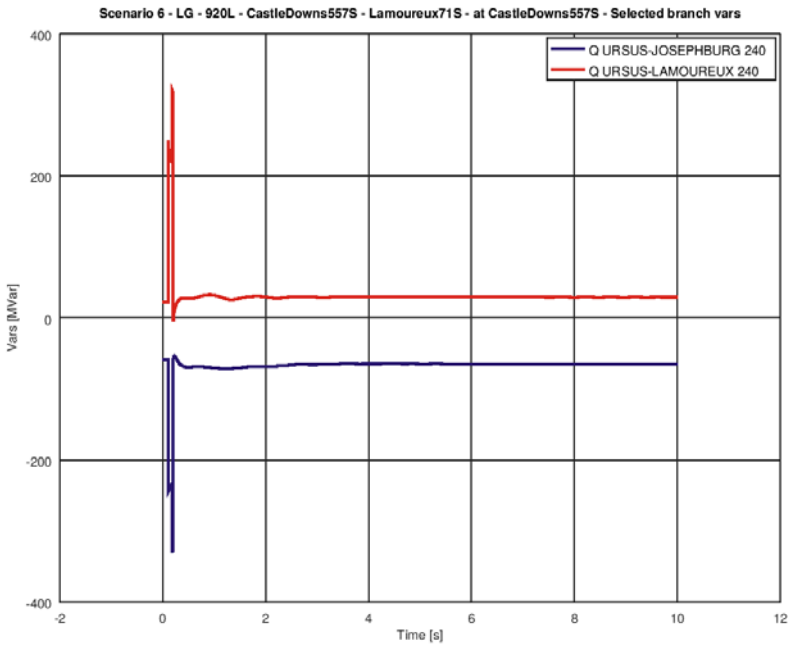


Figure A-212 Scenario 6 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

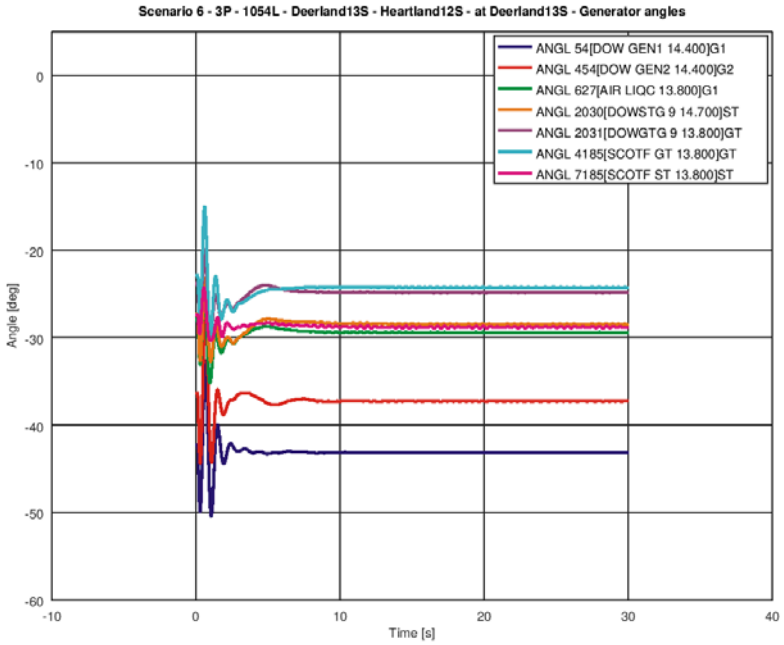


Figure A-213 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

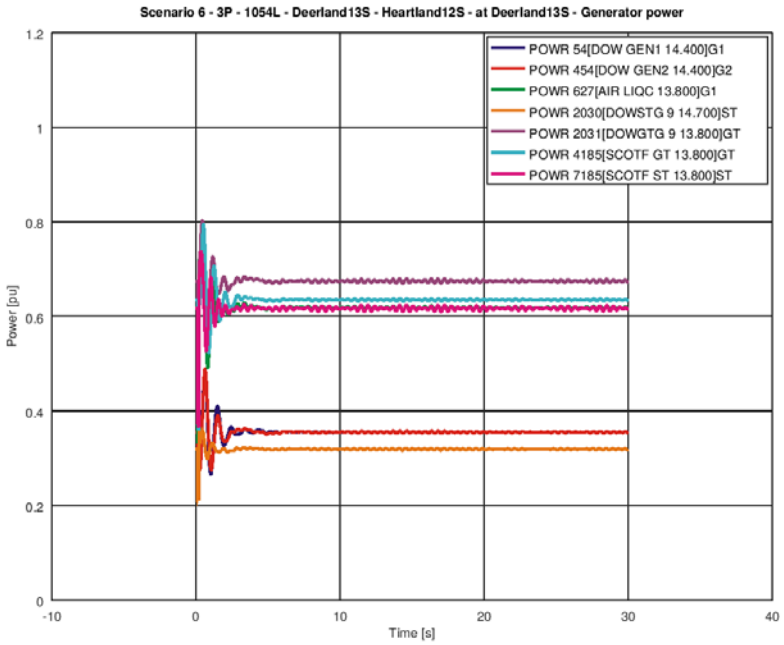


Figure A-214 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

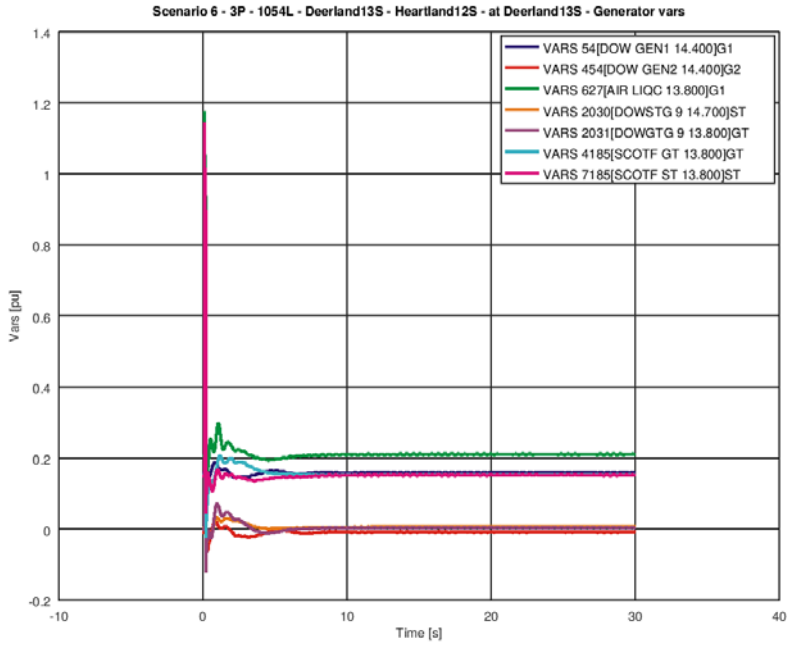


Figure A-215 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

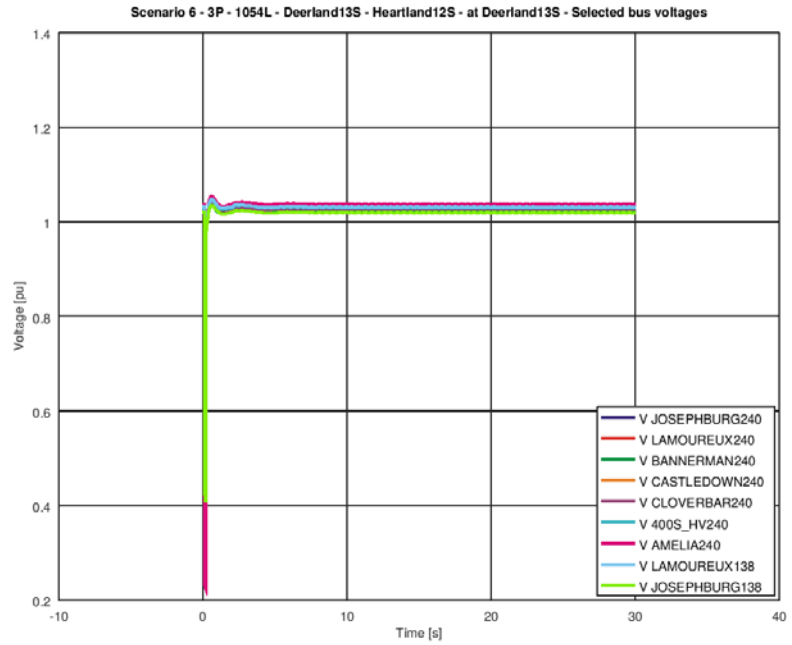


Figure A-216 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

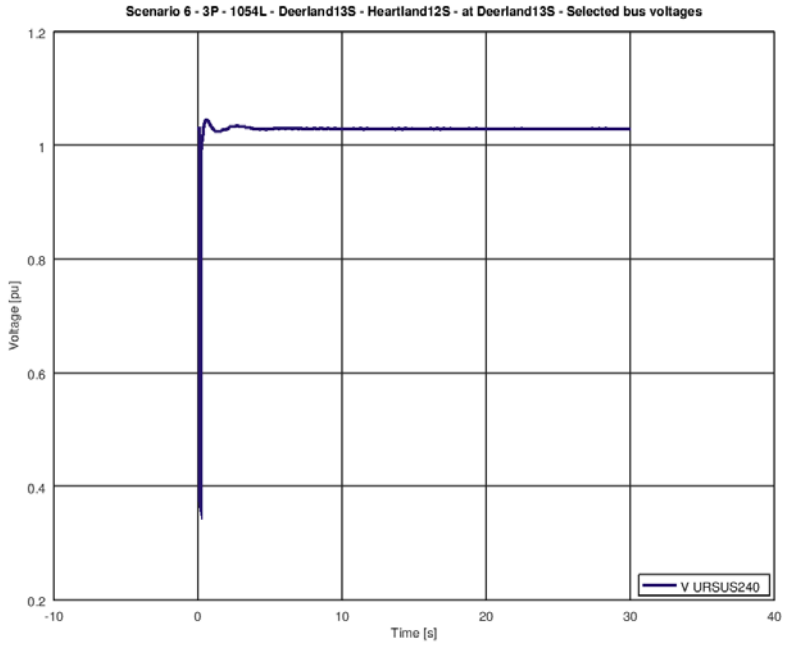


Figure A-217 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

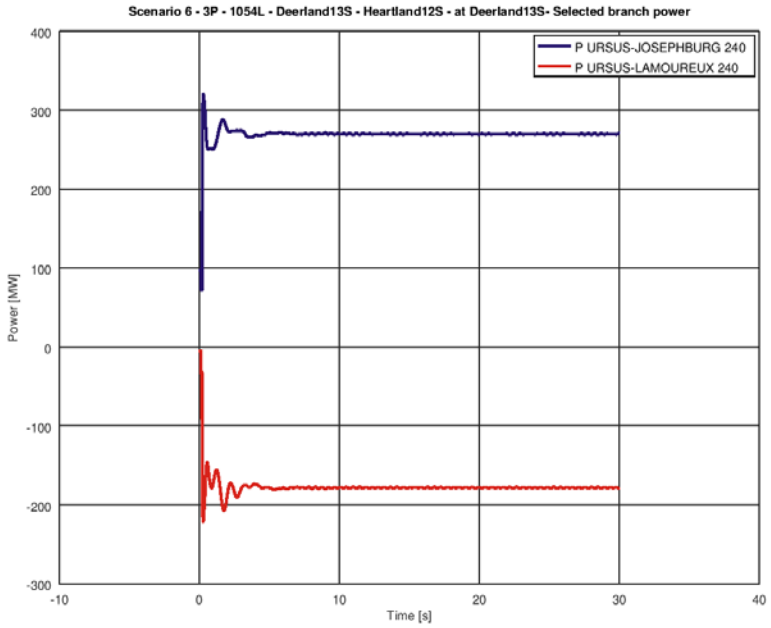


Figure A-218 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

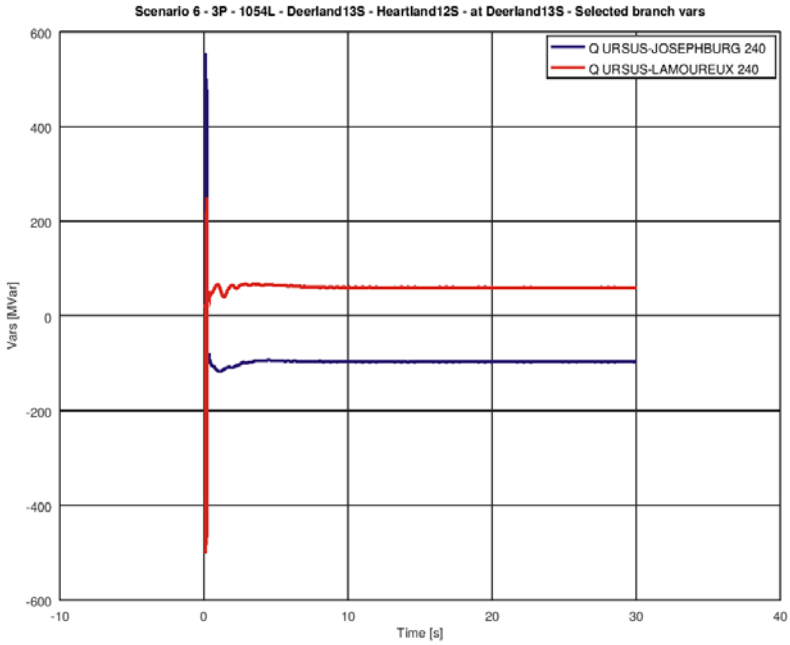


Figure A-219 Scenario 6 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

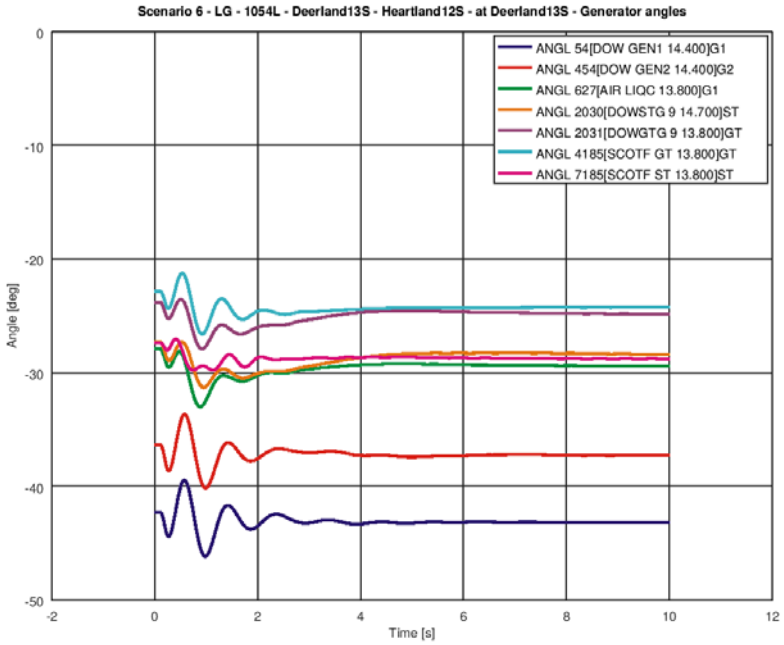


Figure A-220 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

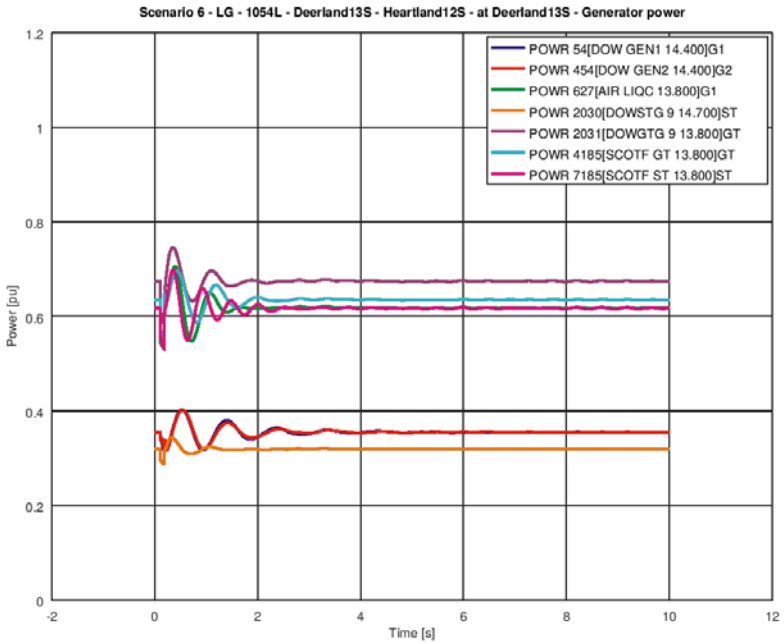


Figure A-221 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

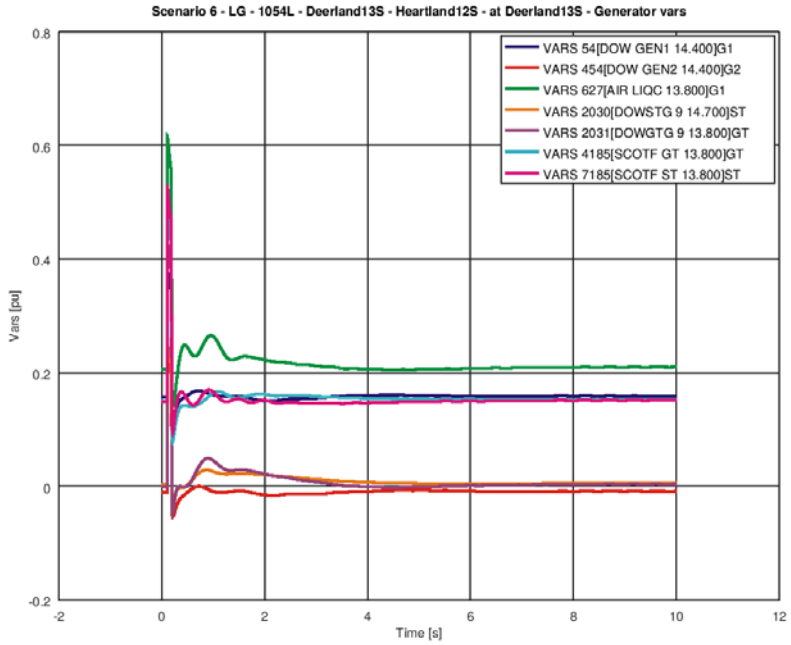


Figure A-222 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

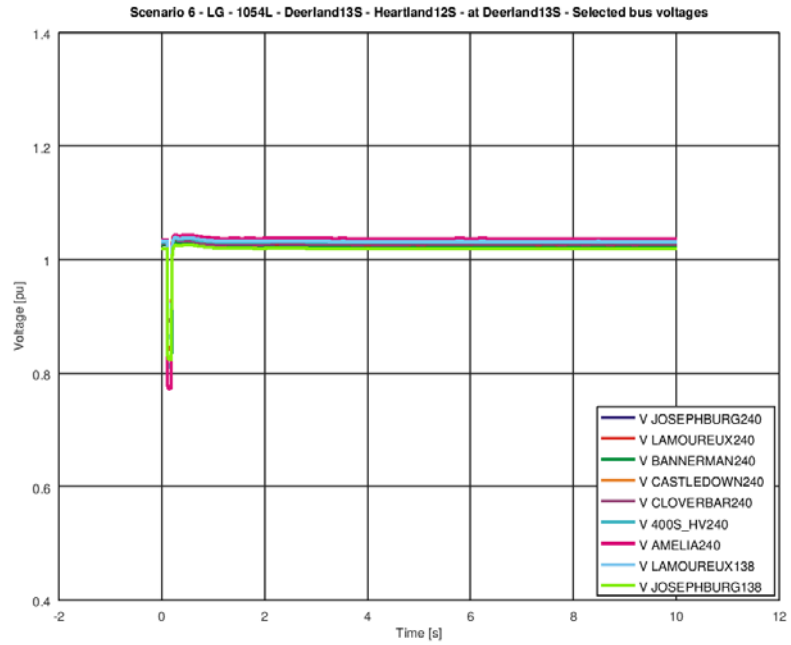


Figure A-223 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

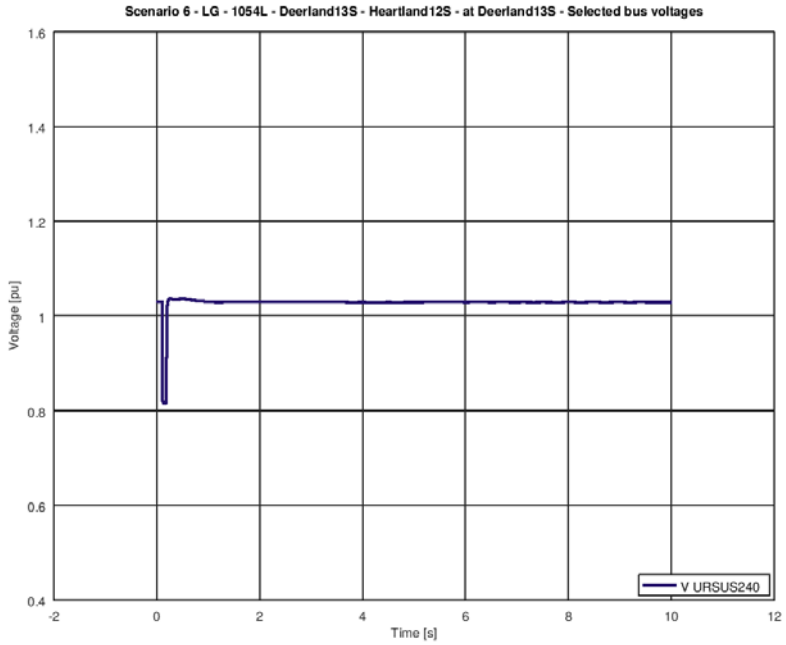


Figure A-224 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

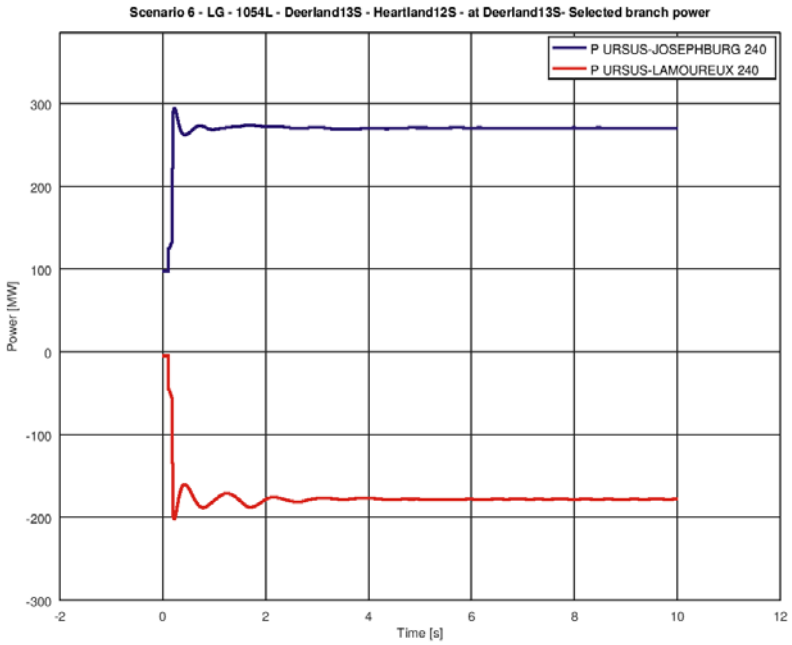


Figure A-225 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

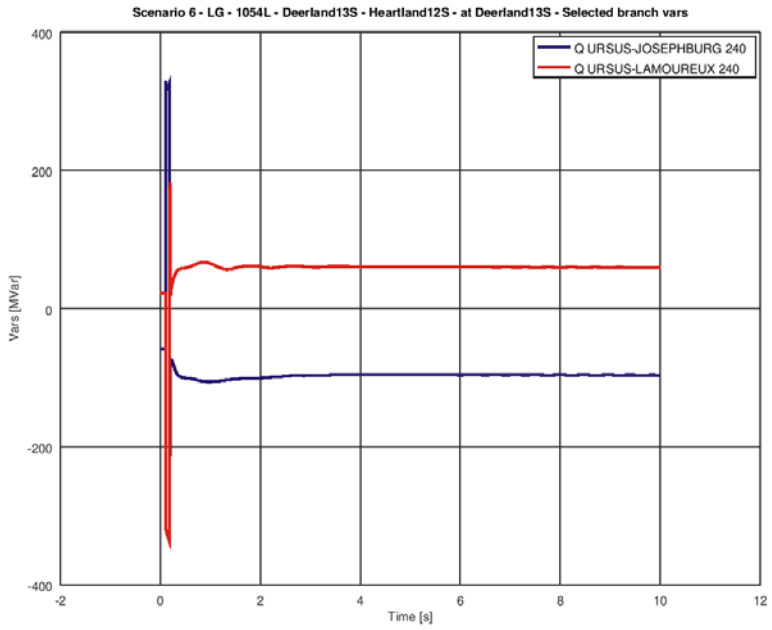


Figure A-226 Scenario 6 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

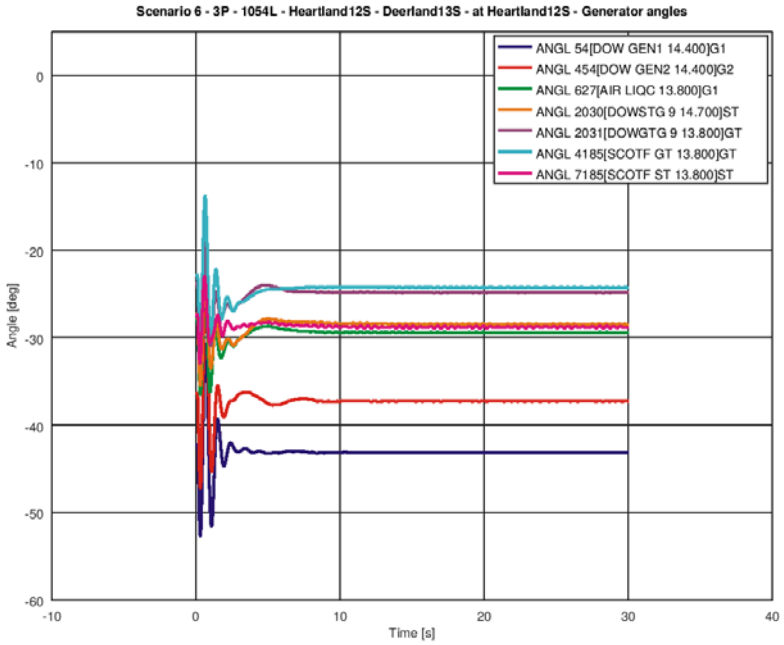


Figure A-227 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

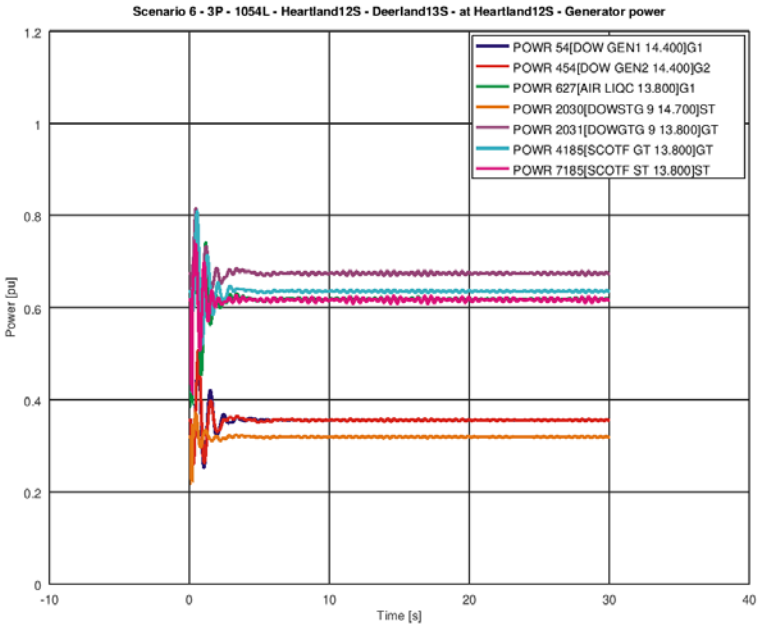


Figure A-228 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

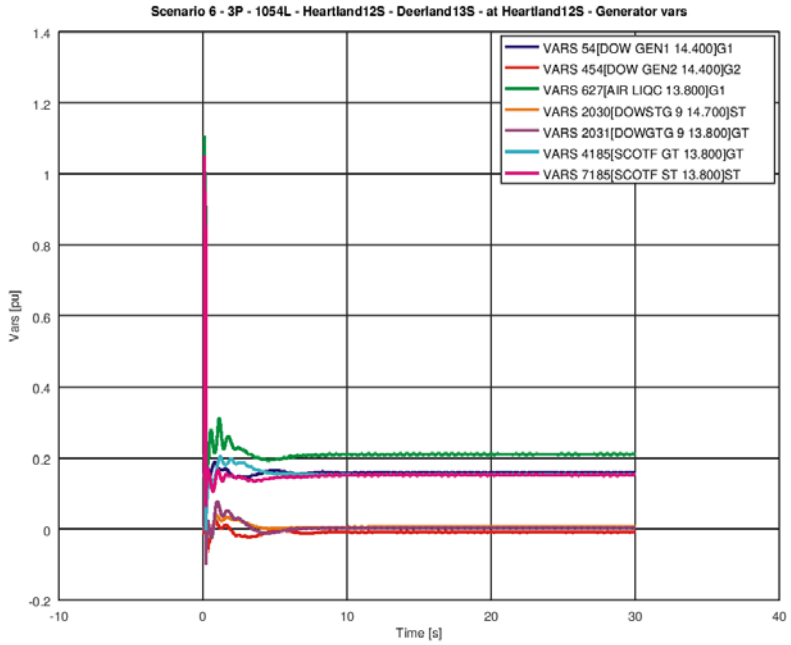


Figure A-229 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

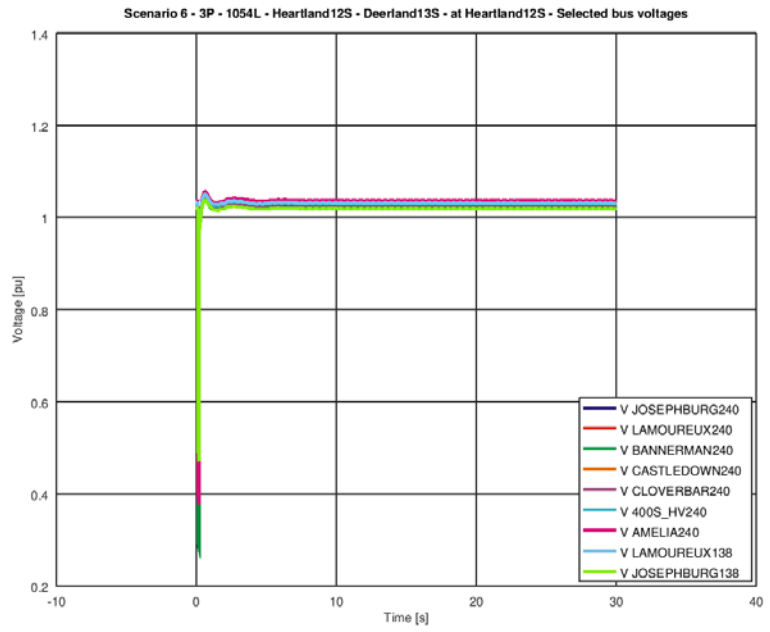


Figure A-230 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

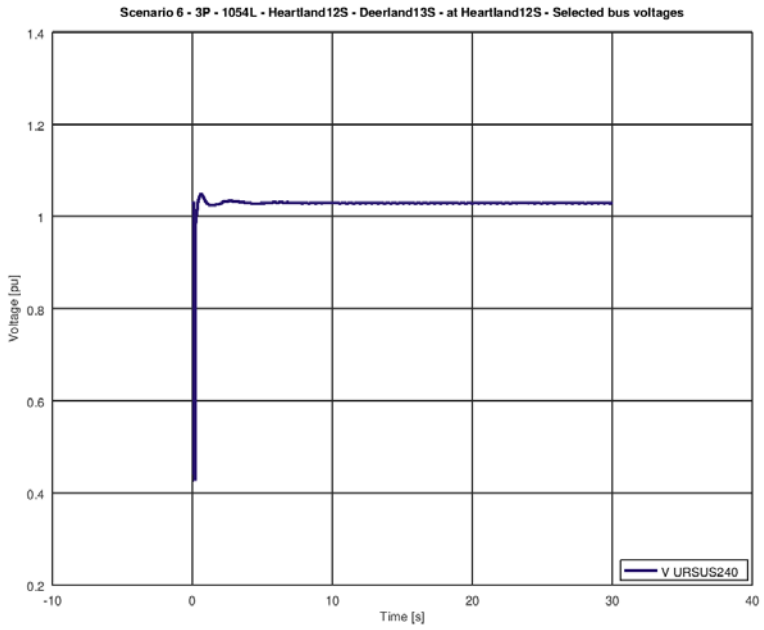


Figure A-231 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

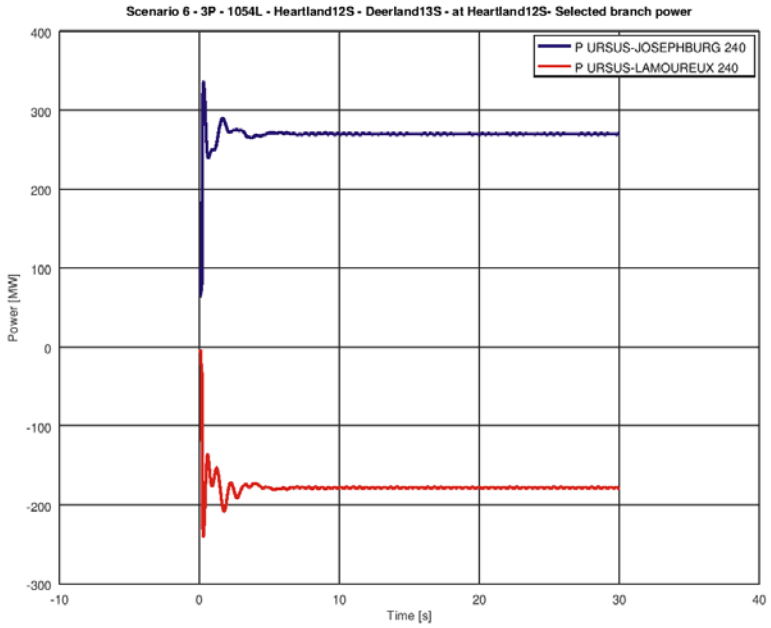


Figure A-232 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

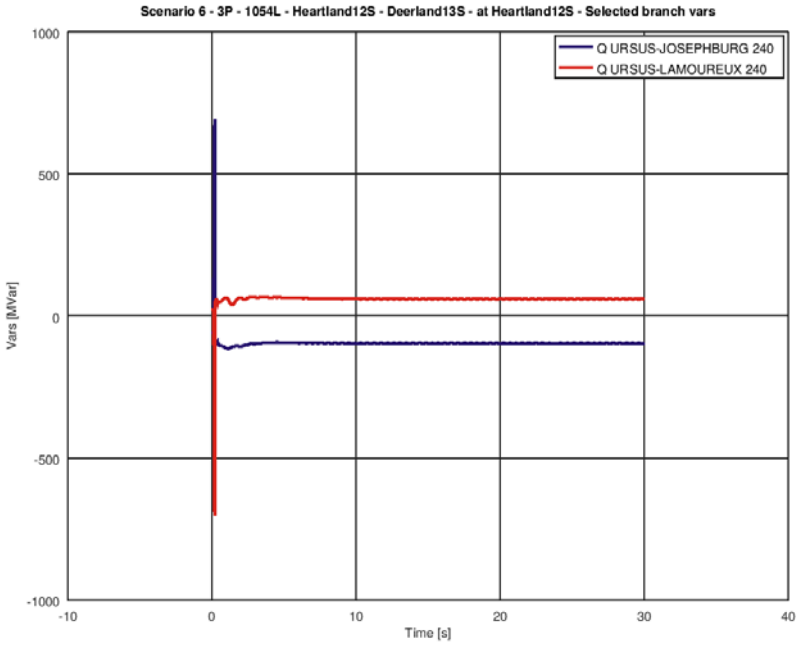


Figure A-233 Scenario 6 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

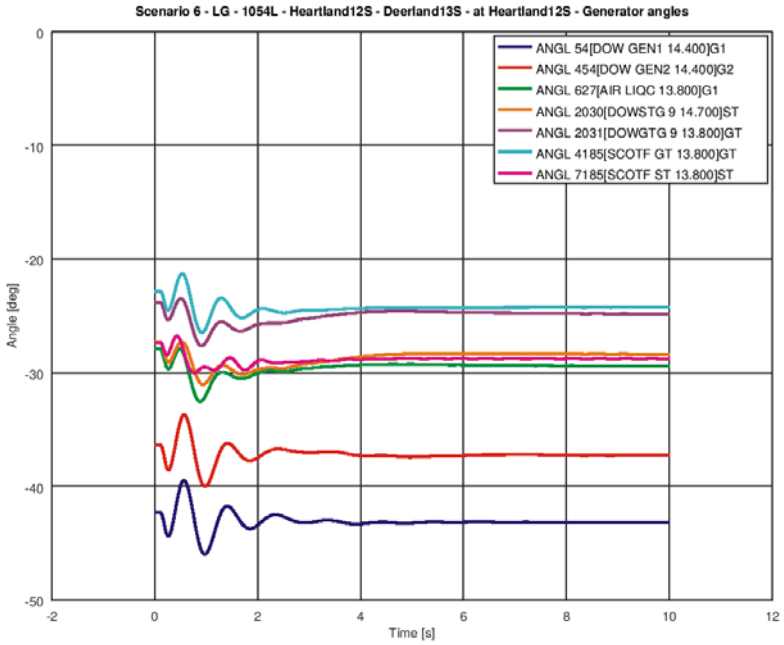


Figure A-234 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

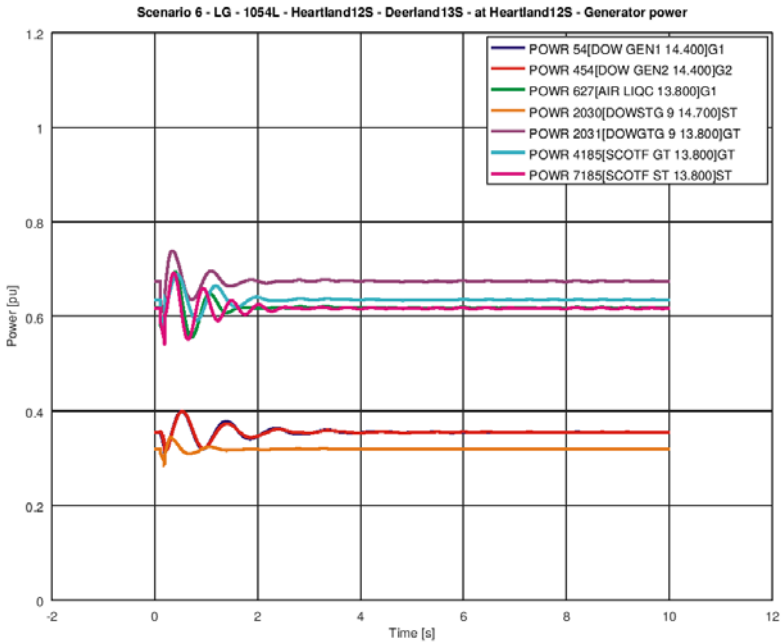


Figure A-235 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

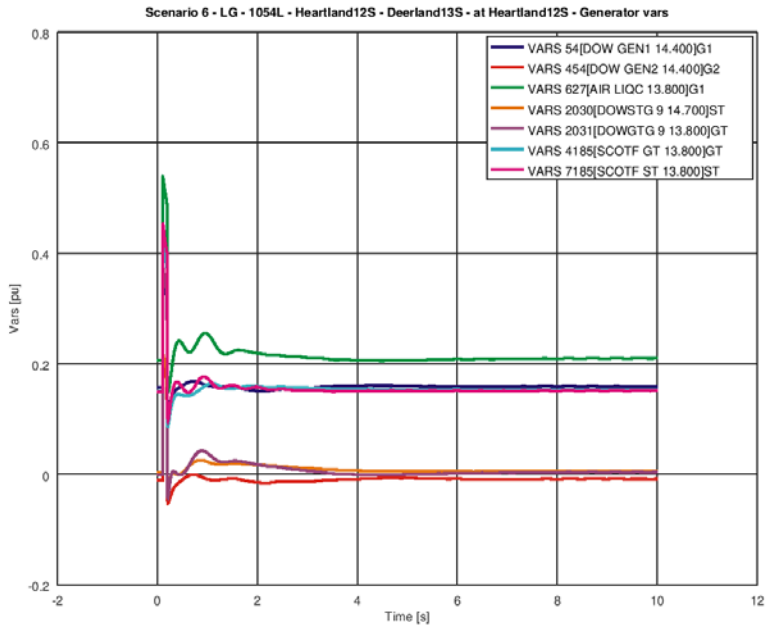


Figure A-236 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

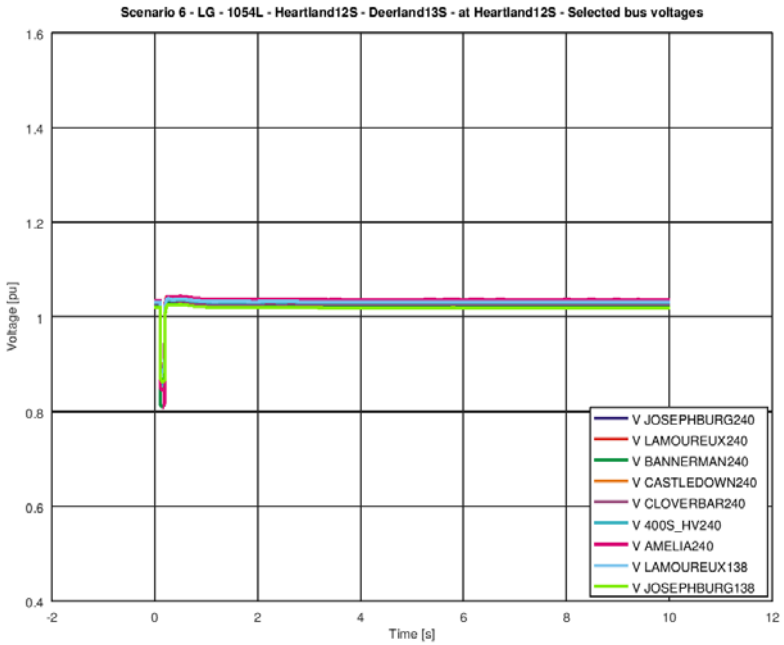


Figure A-237 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

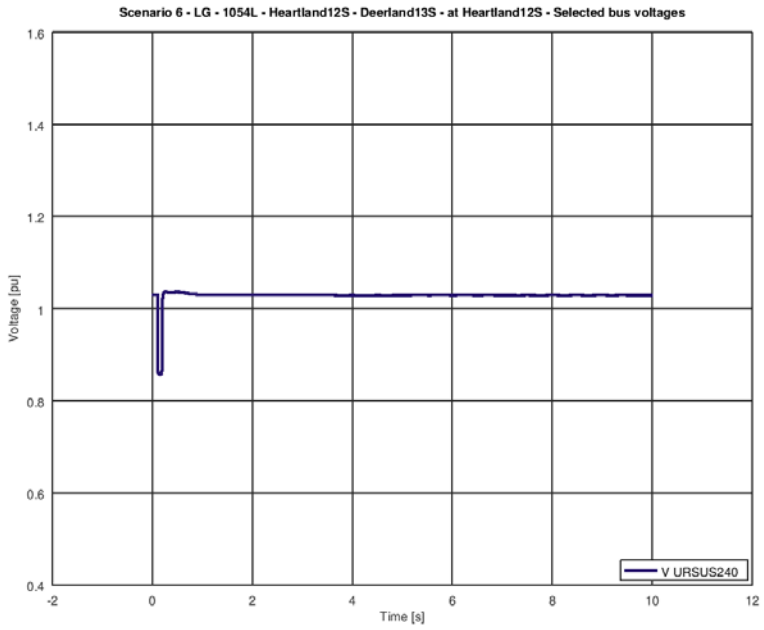


Figure A-238 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

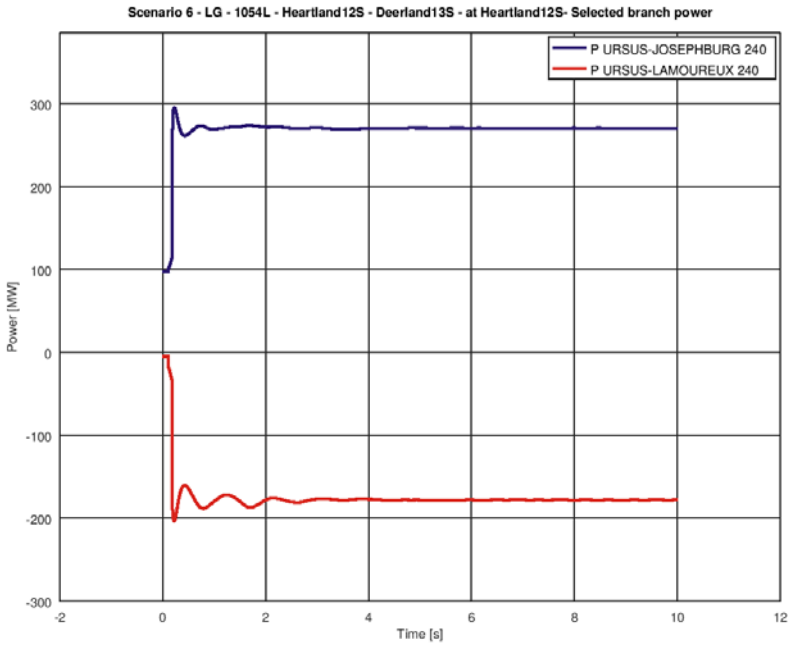


Figure A-239 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

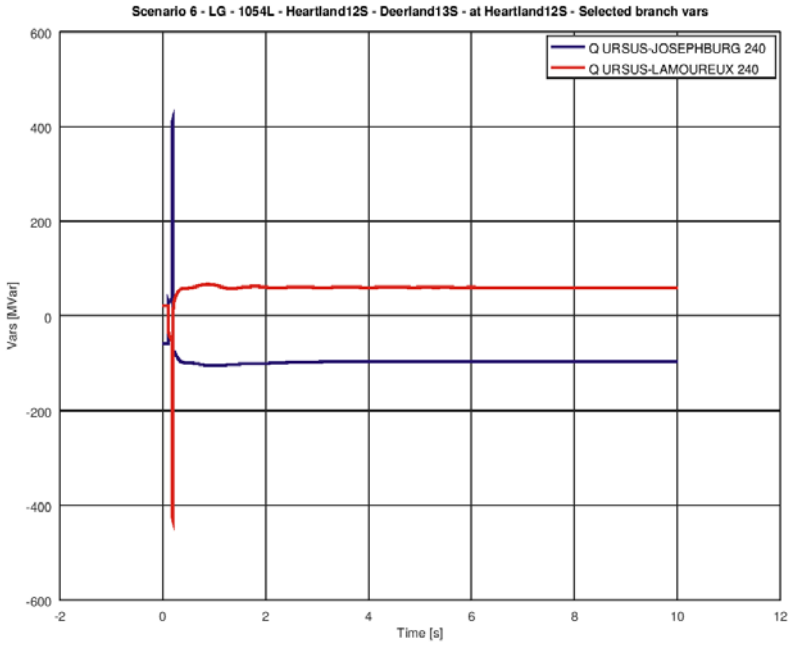


Figure A-240 Scenario 6 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

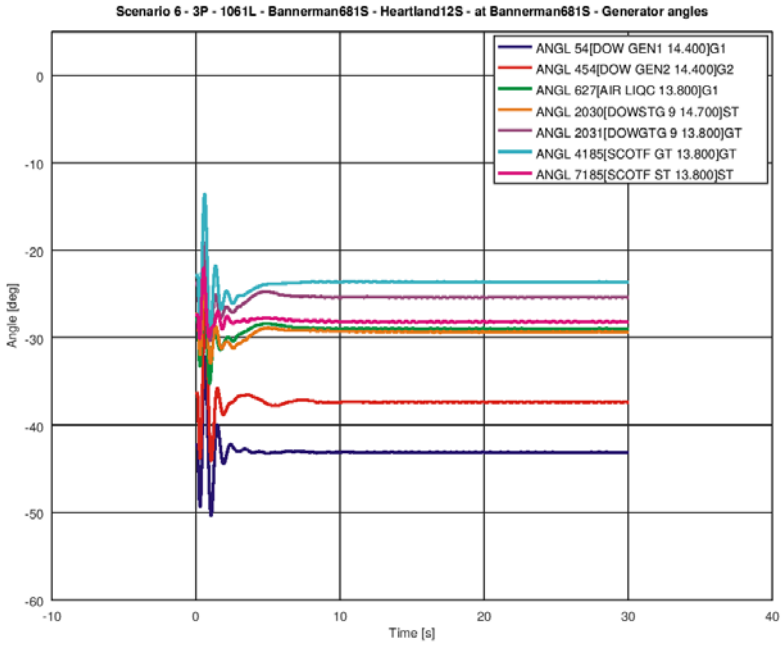


Figure A-241 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

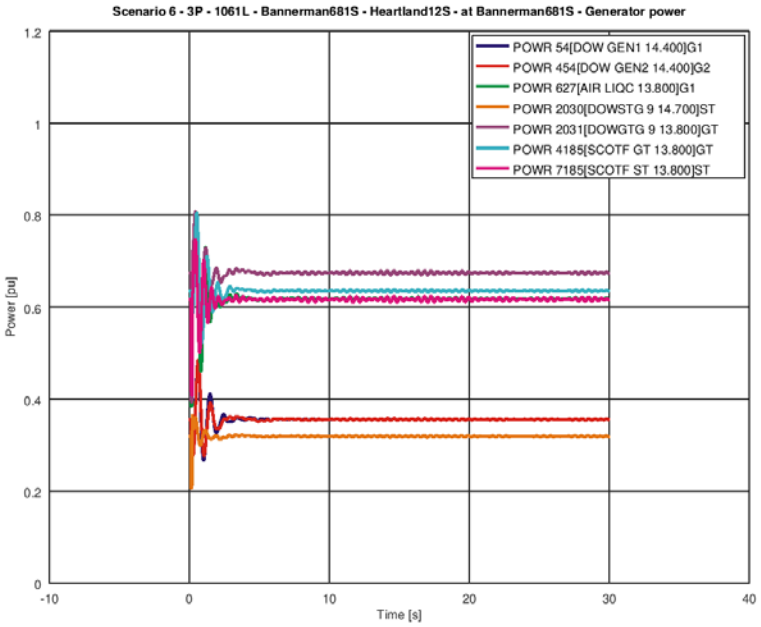


Figure A-242 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

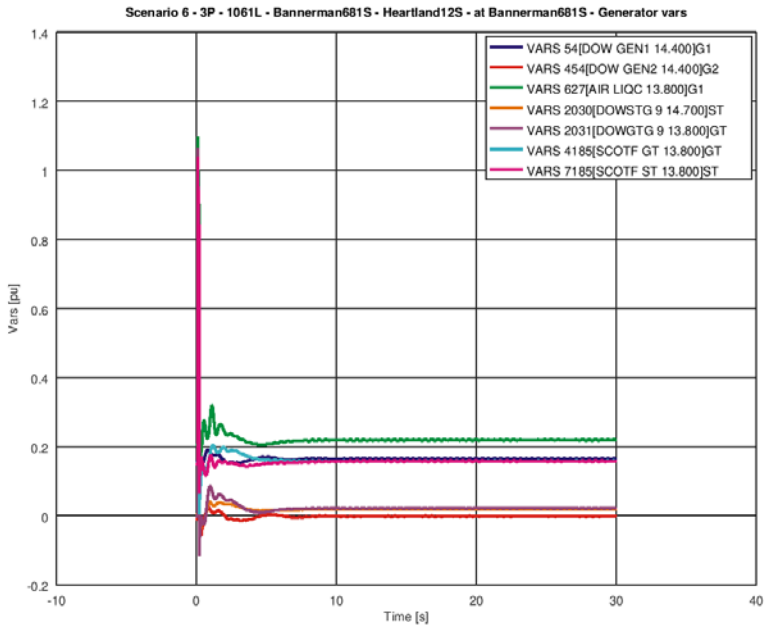


Figure A-243 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

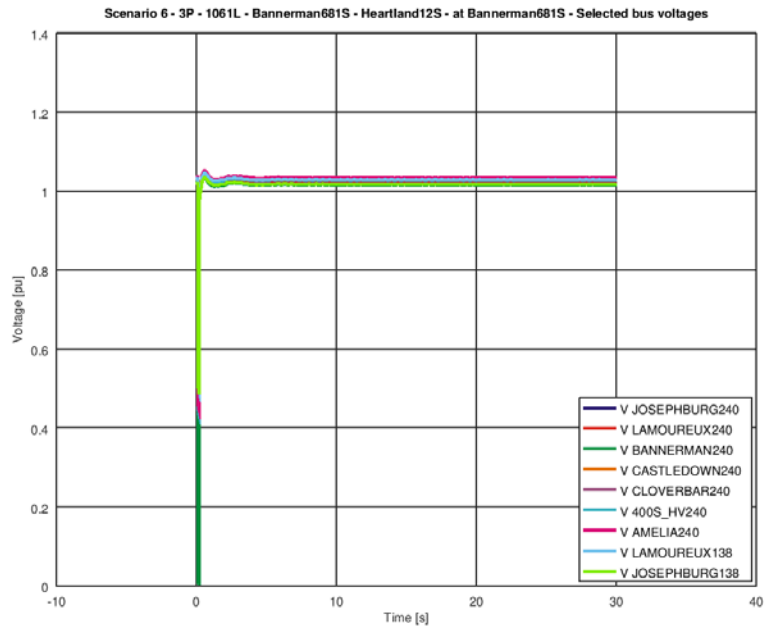


Figure A-244 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

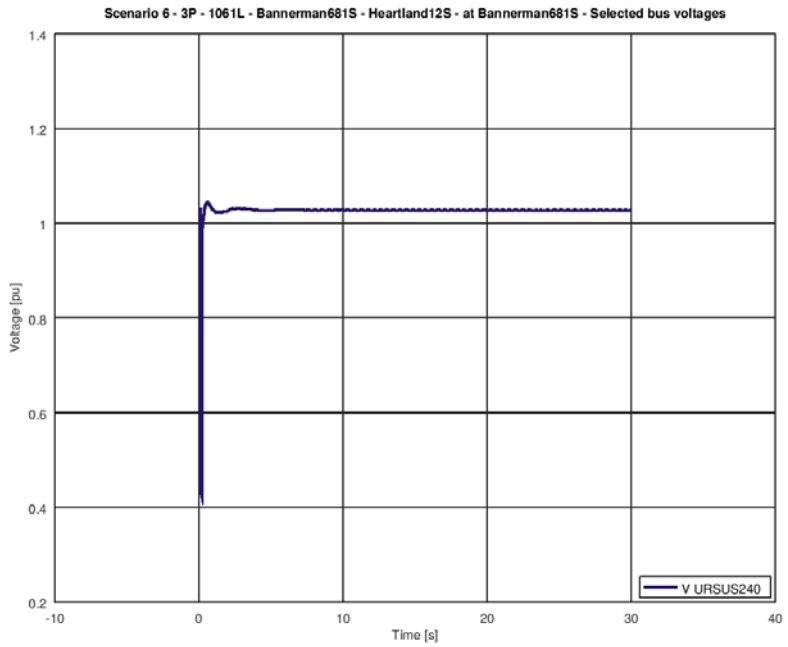


Figure A-245 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

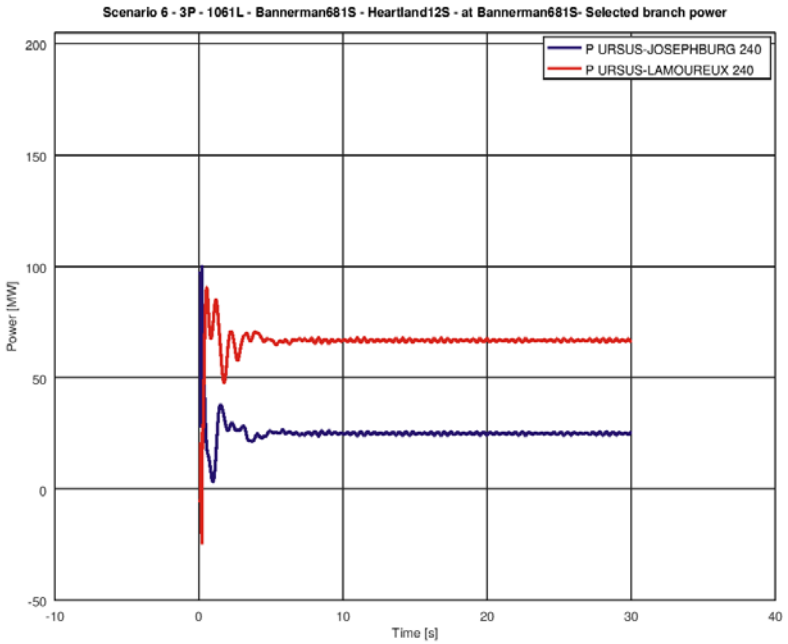


Figure A-246 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

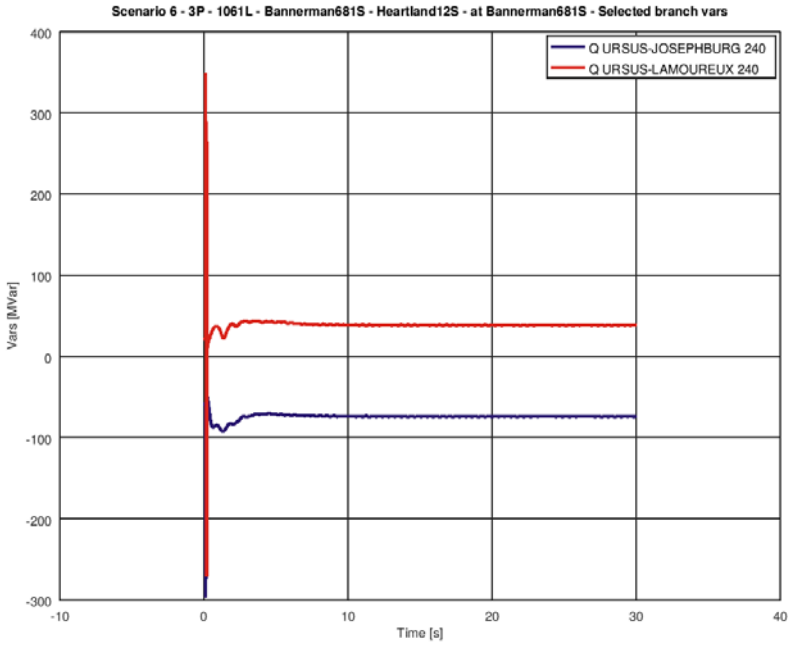


Figure A-247 Scenario 6 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

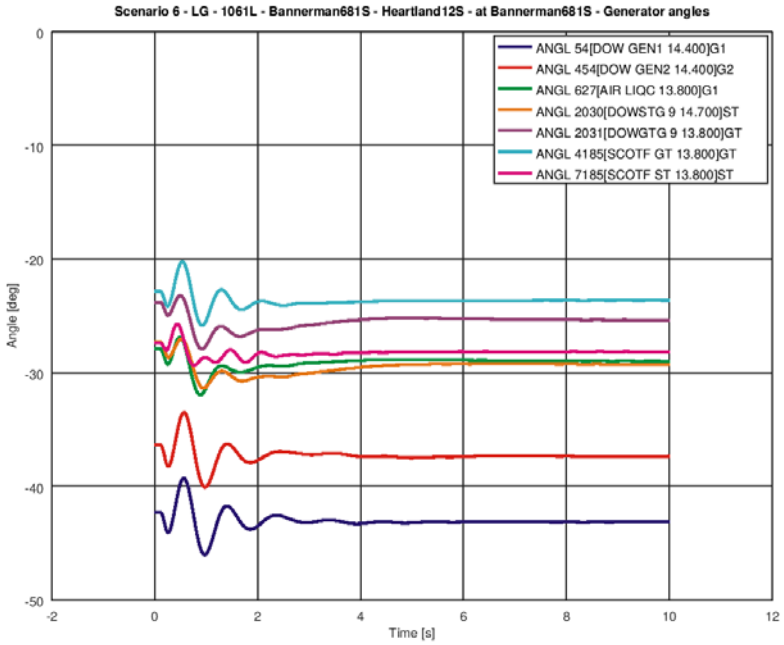


Figure A-248 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

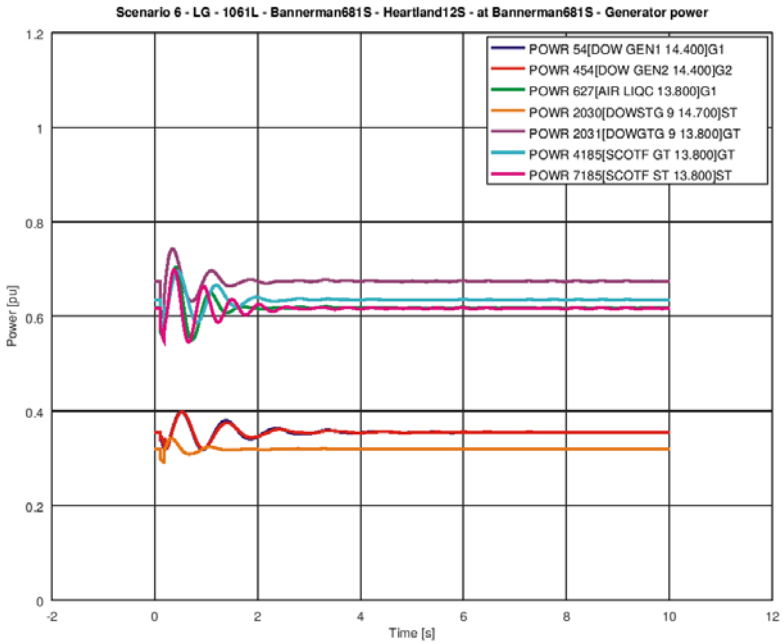


Figure A-249 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

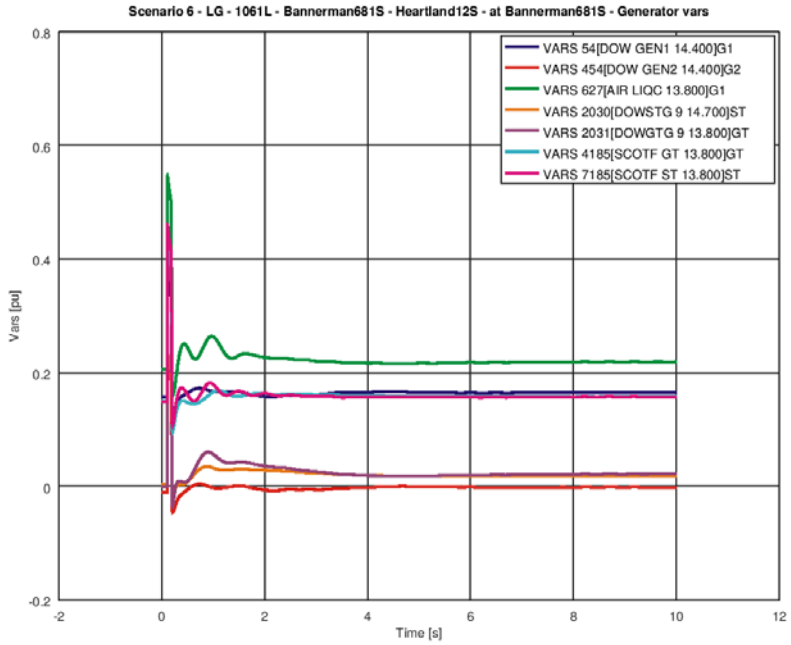


Figure A-250 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

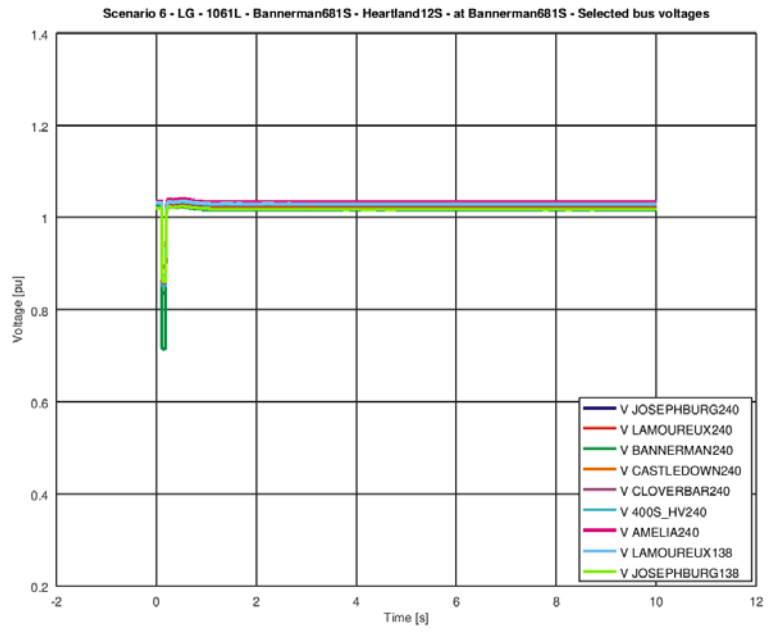


Figure A-251 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

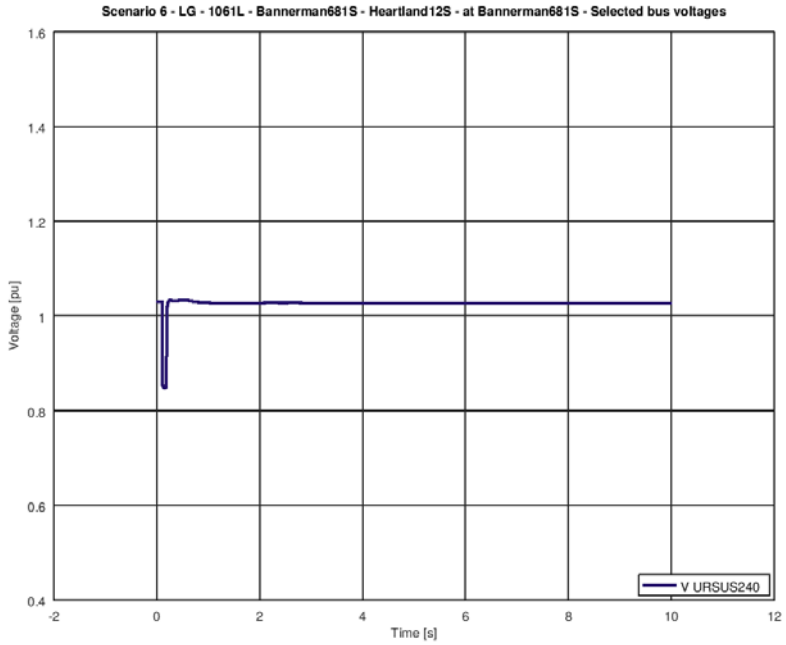


Figure A-252 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

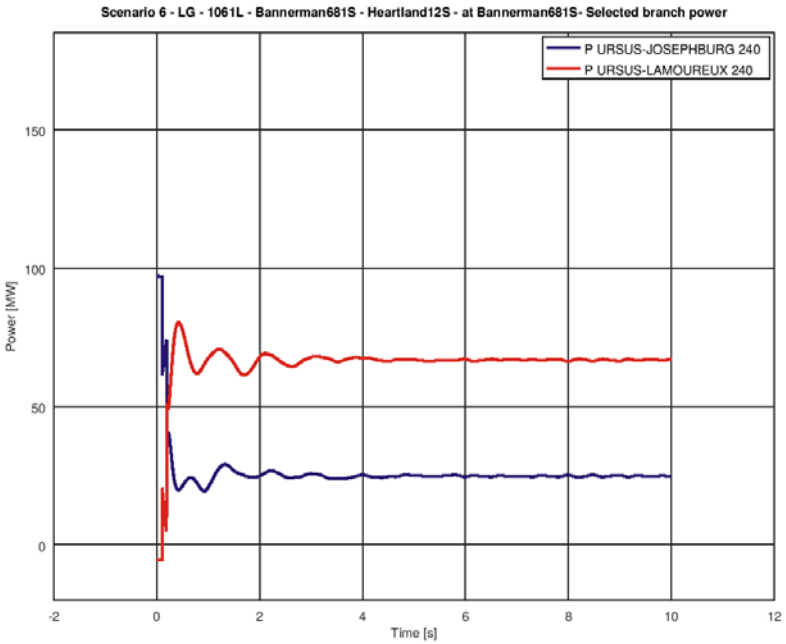


Figure A-253 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

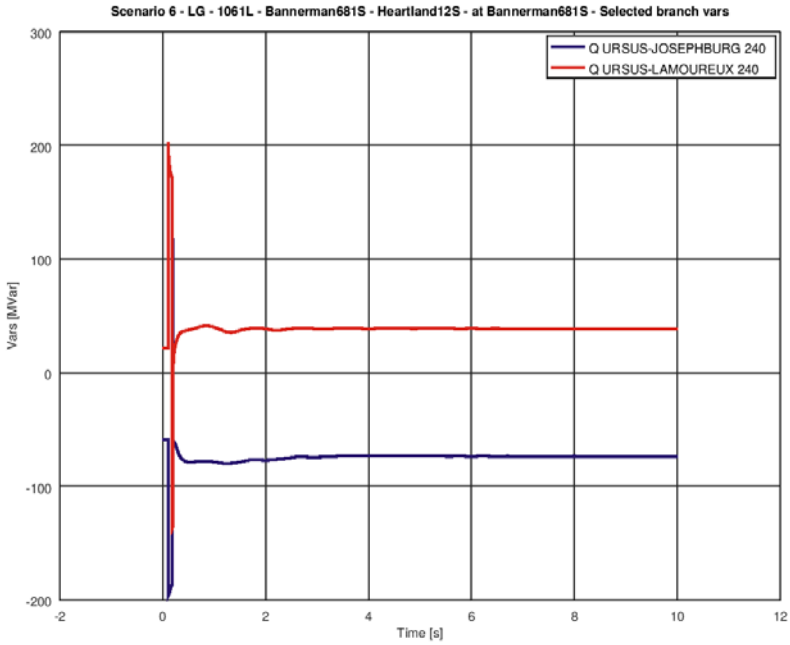


Figure A-254 Scenario 6 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

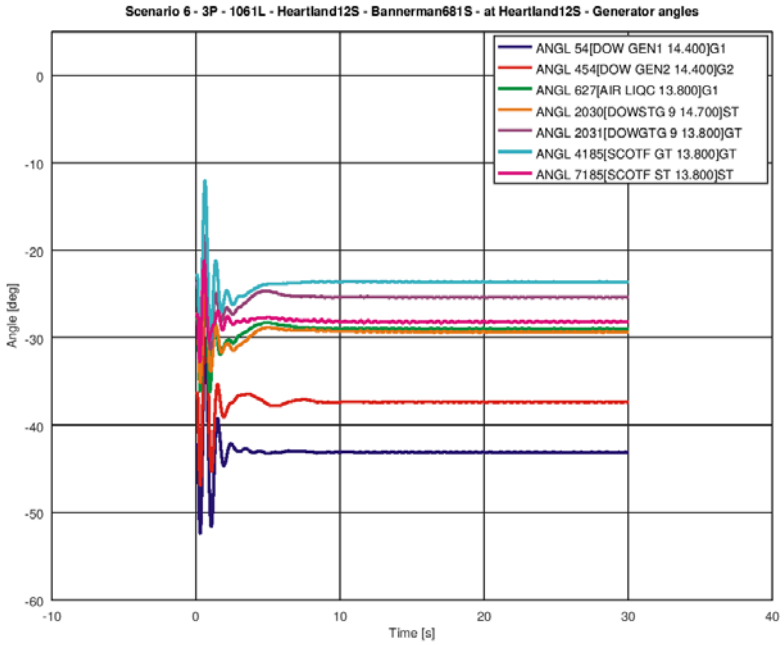


Figure A-255 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

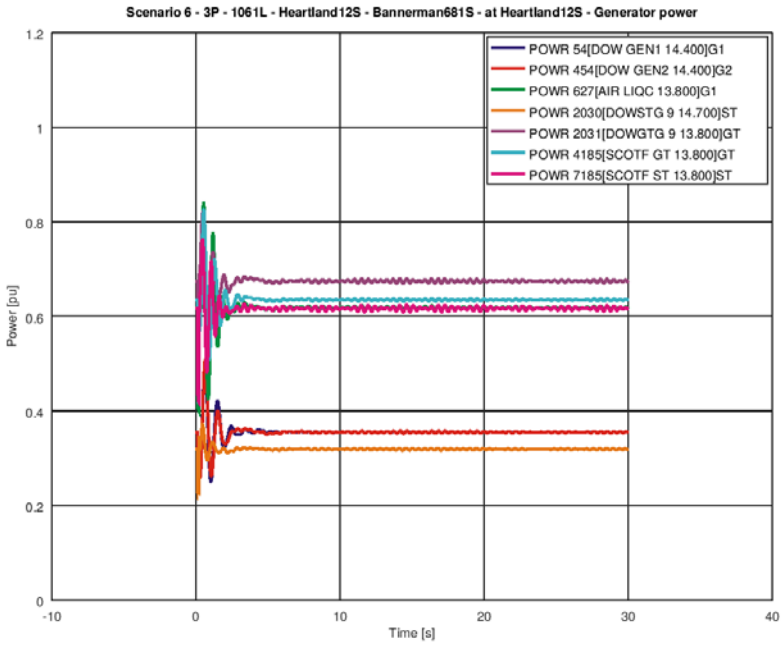


Figure A-256 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

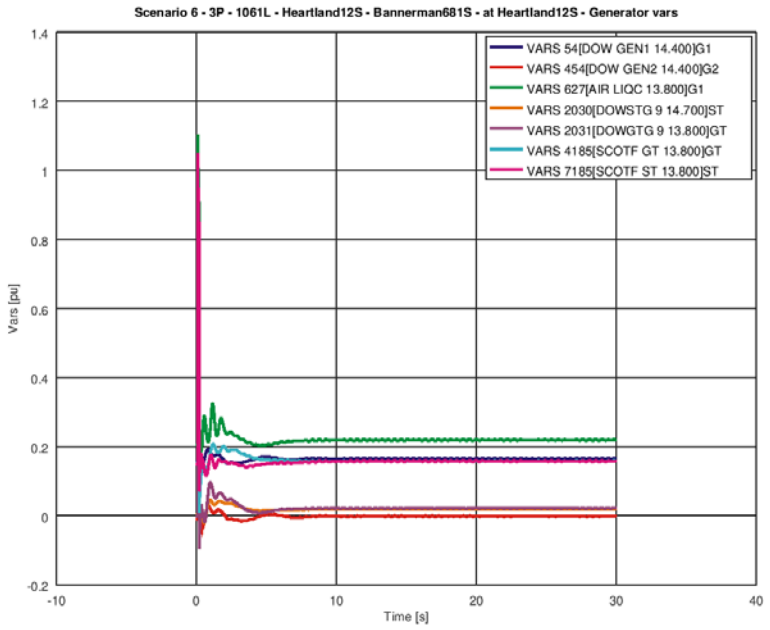


Figure A-257 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

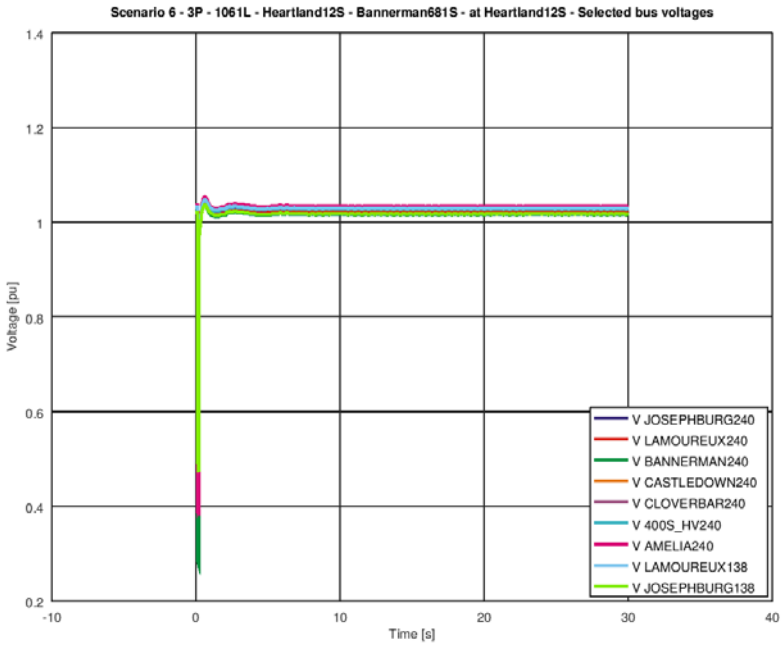


Figure A-258 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

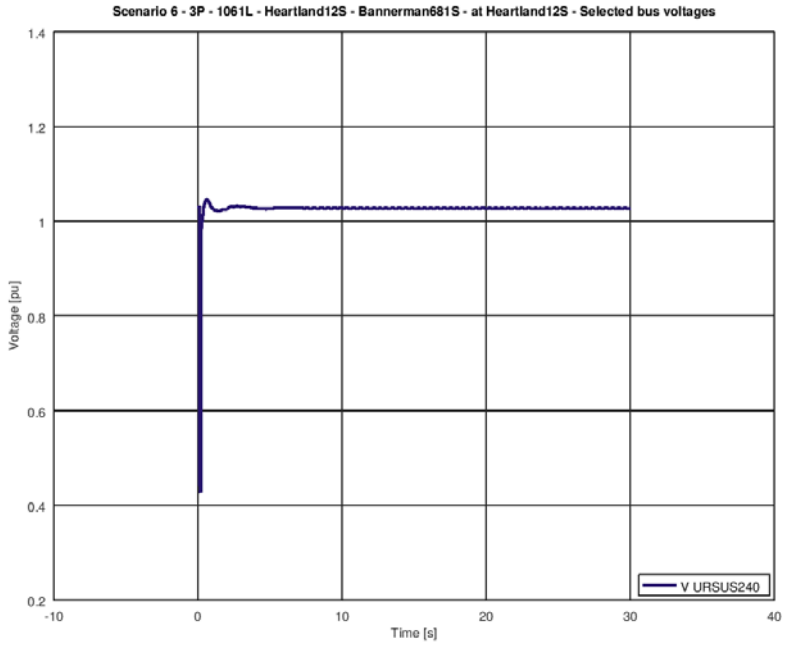


Figure A-259 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

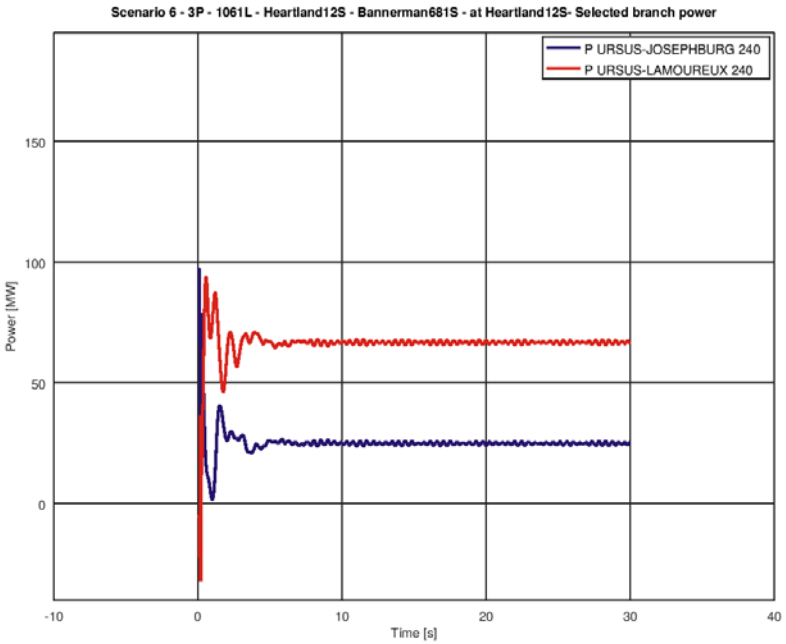


Figure A-260 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

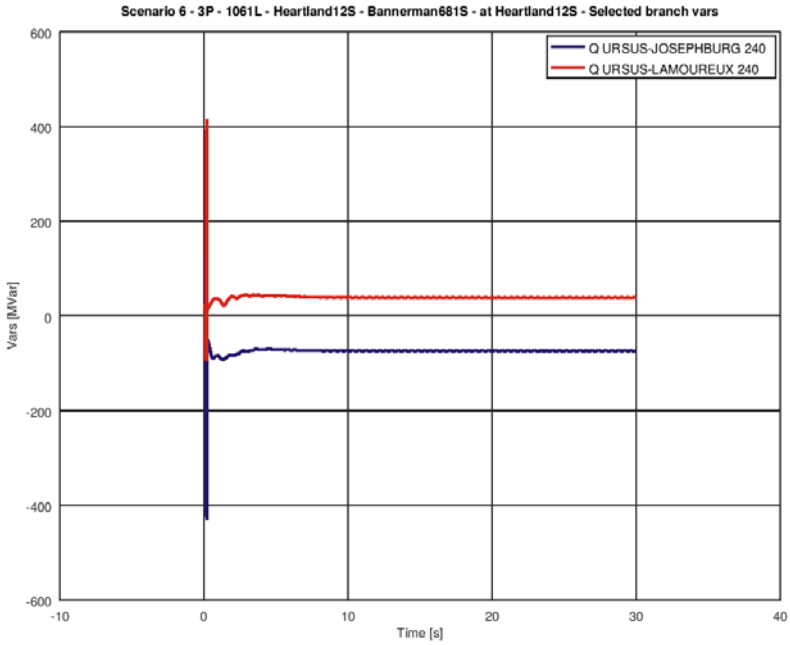


Figure A-261 Scenario 6 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

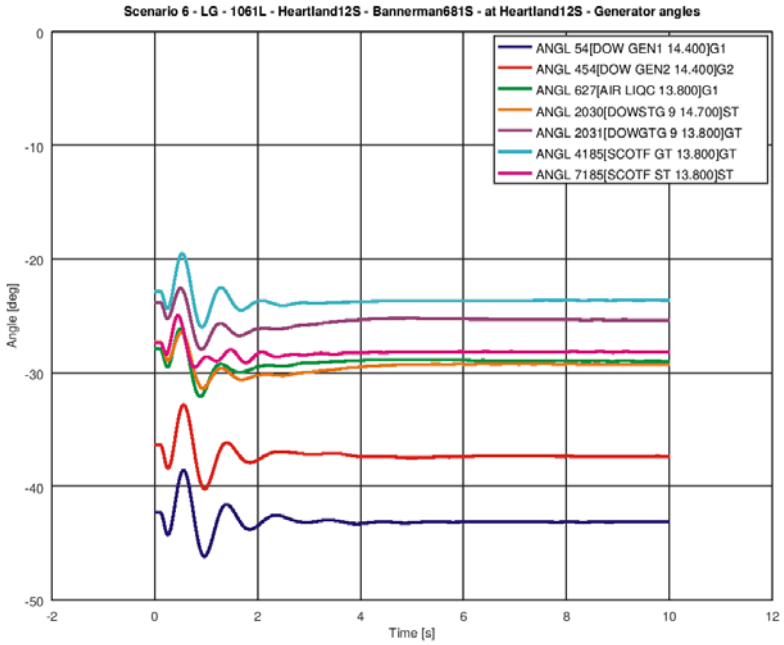


Figure A-262 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

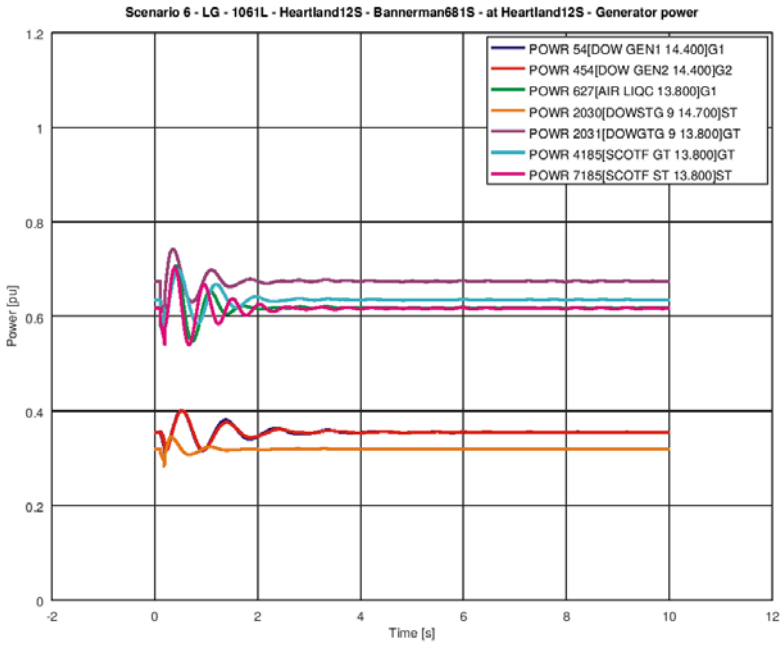


Figure A-263 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

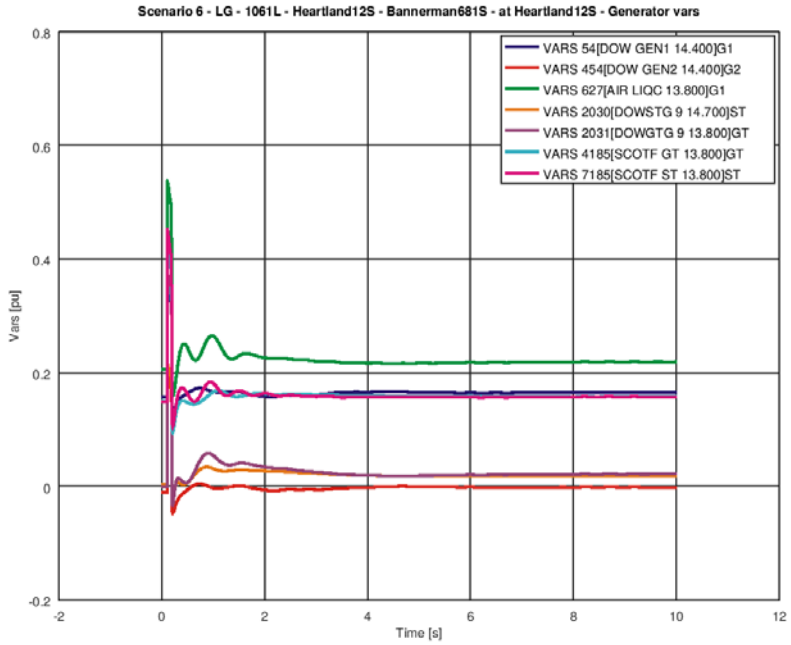


Figure A-264 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

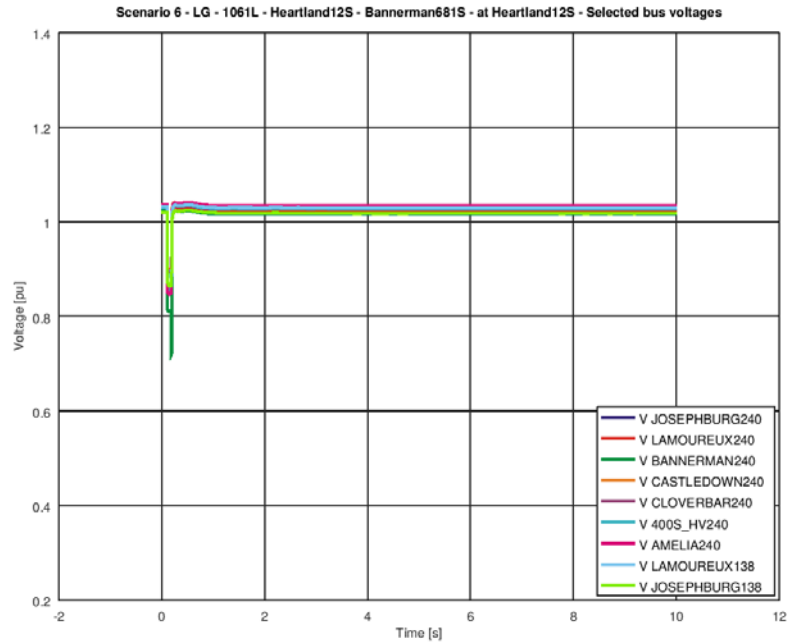


Figure A-265 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

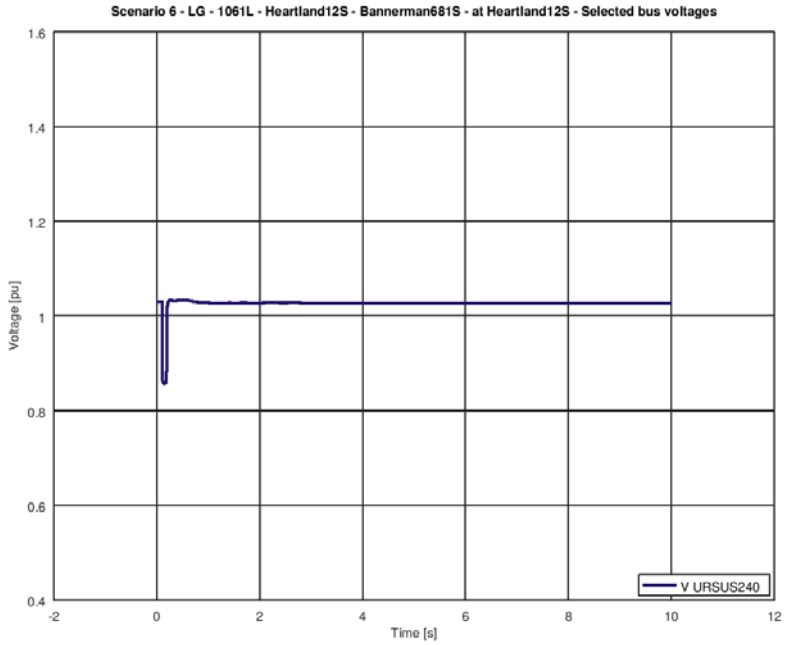


Figure A-266 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

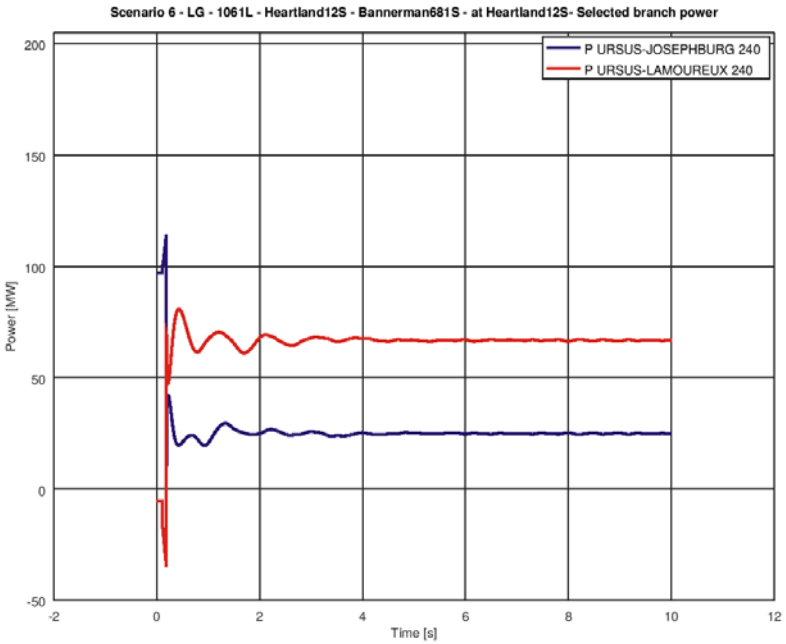


Figure A-267 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

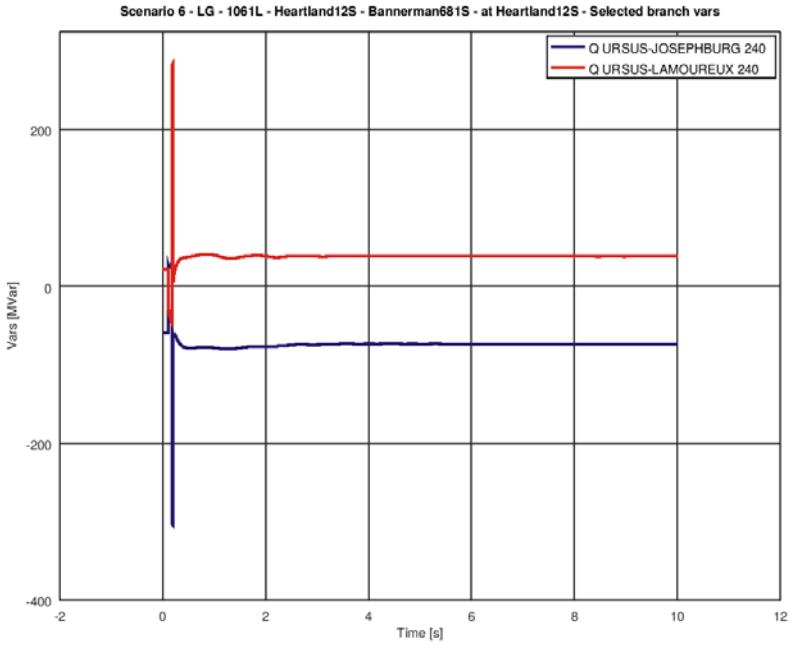


Figure A-268 Scenario 6 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

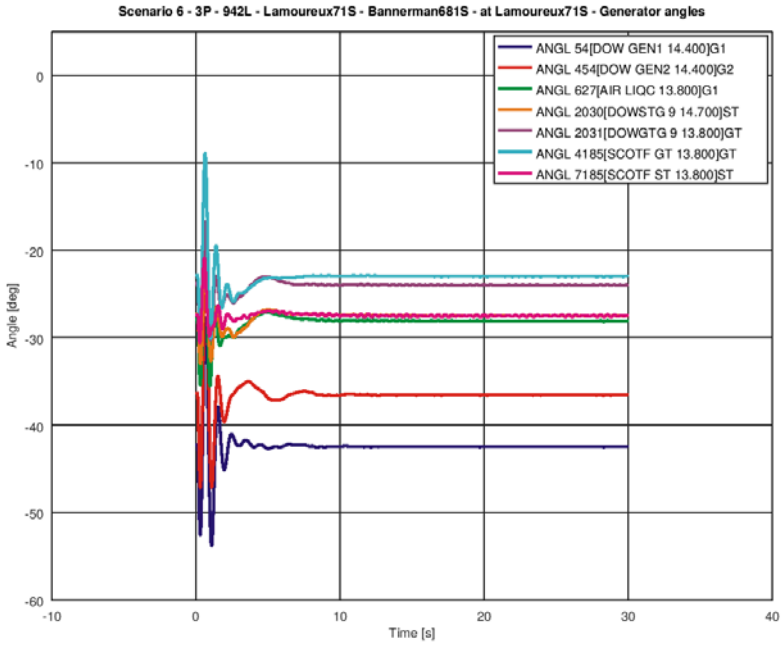


Figure A-269 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

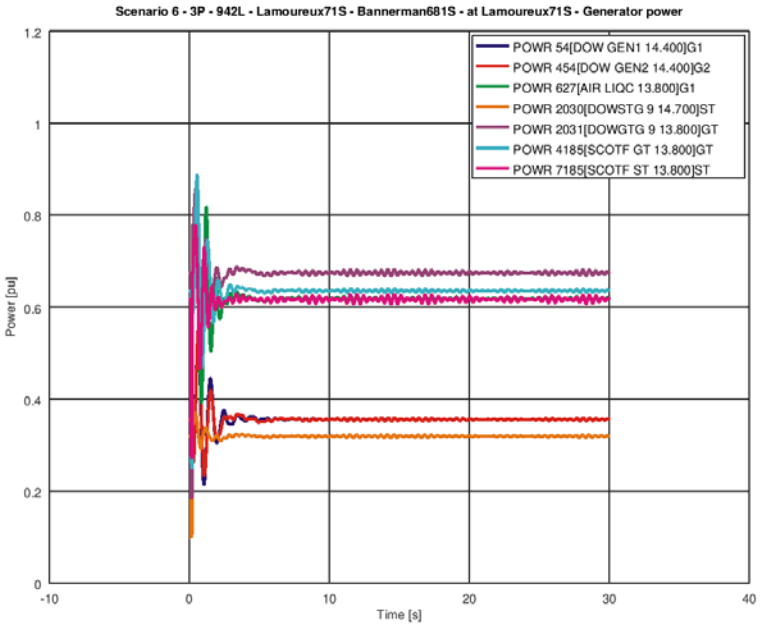


Figure A-270 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

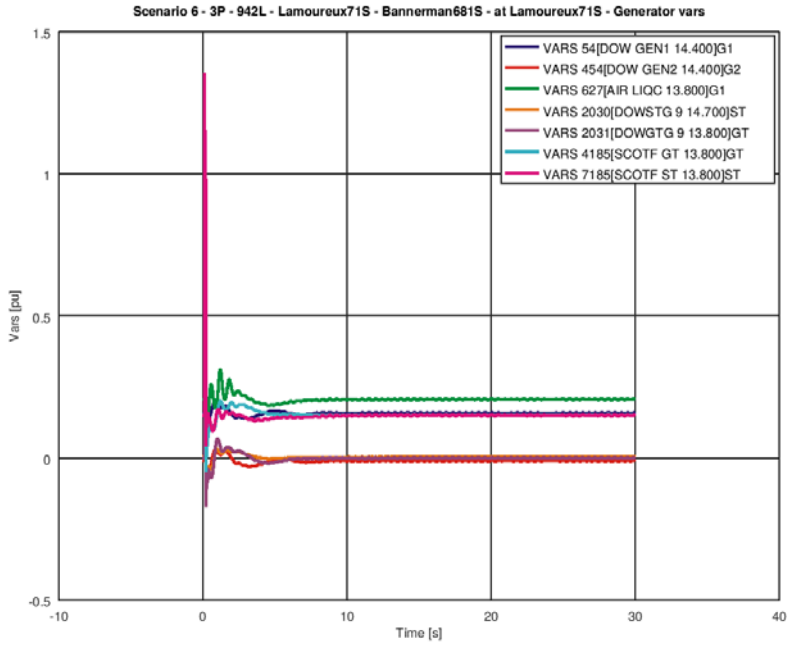


Figure A-271 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

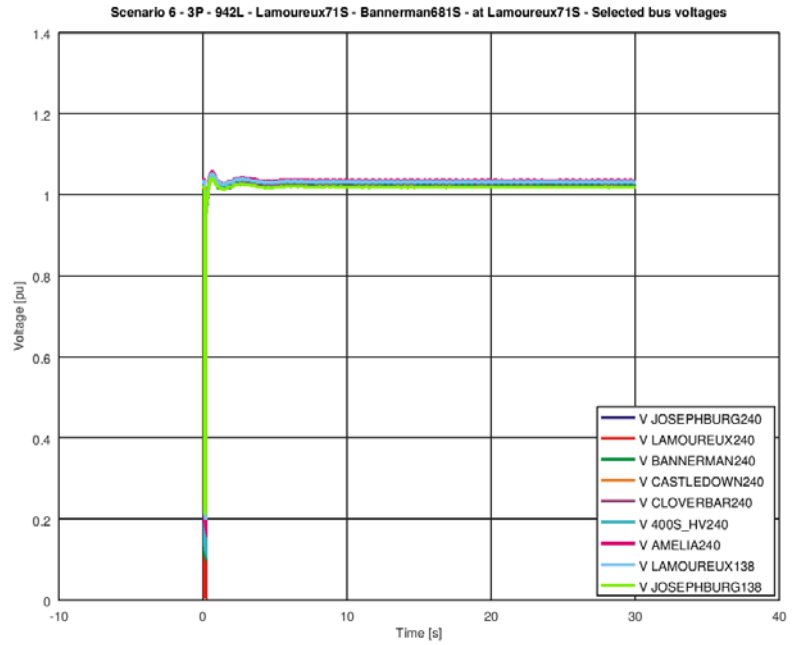


Figure A-272 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

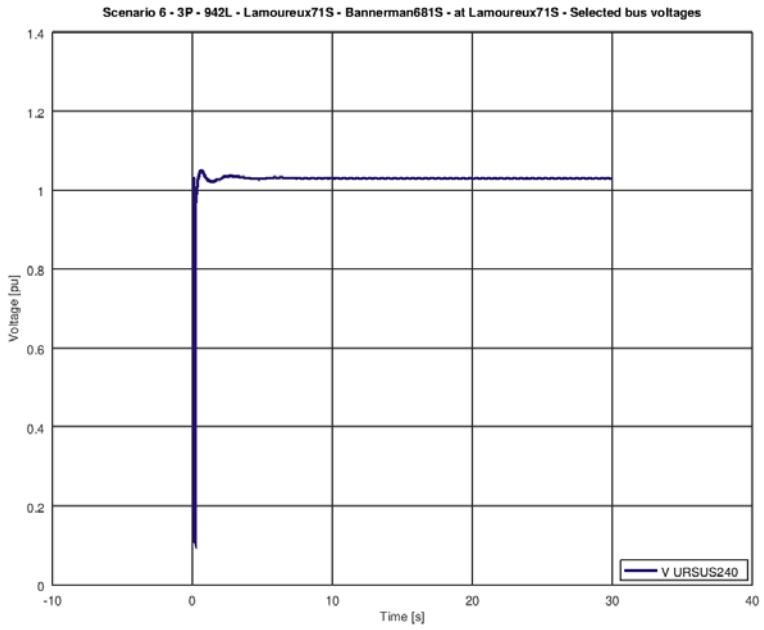


Figure A-273 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

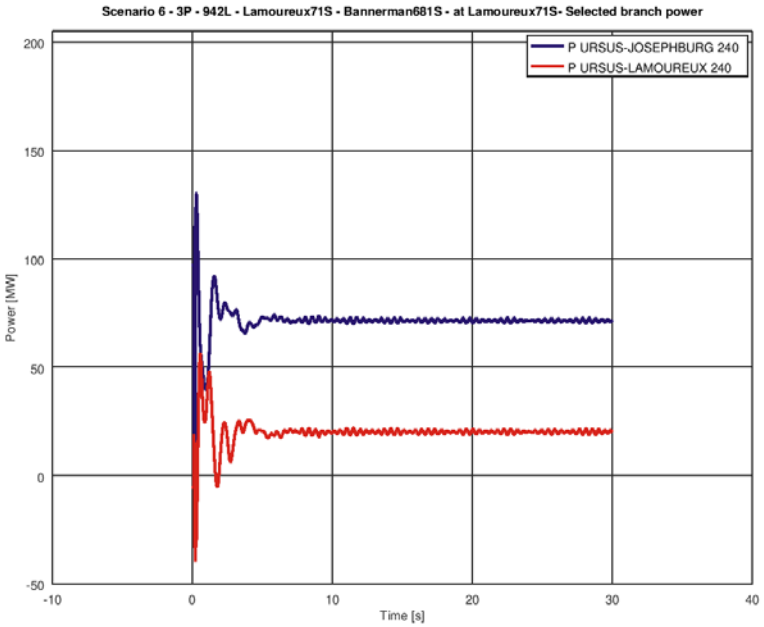


Figure A-274 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

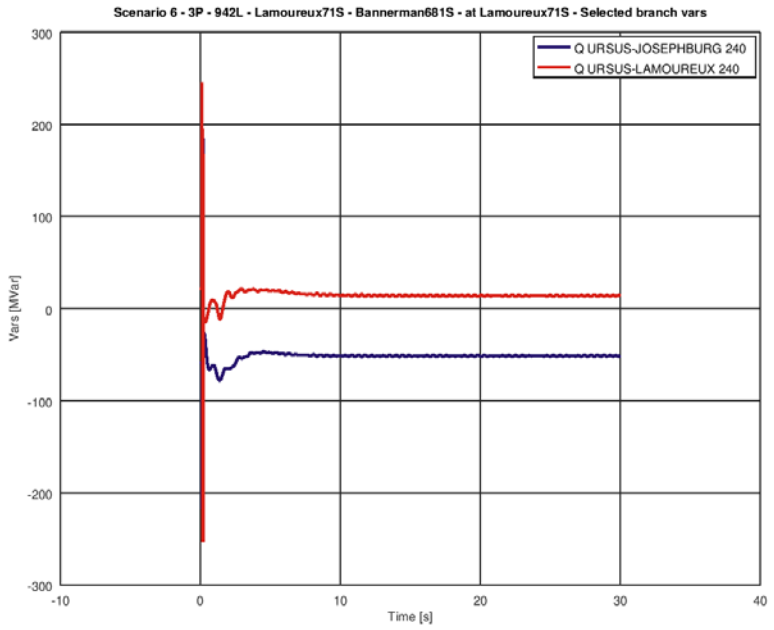


Figure A-275 Scenario 6 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

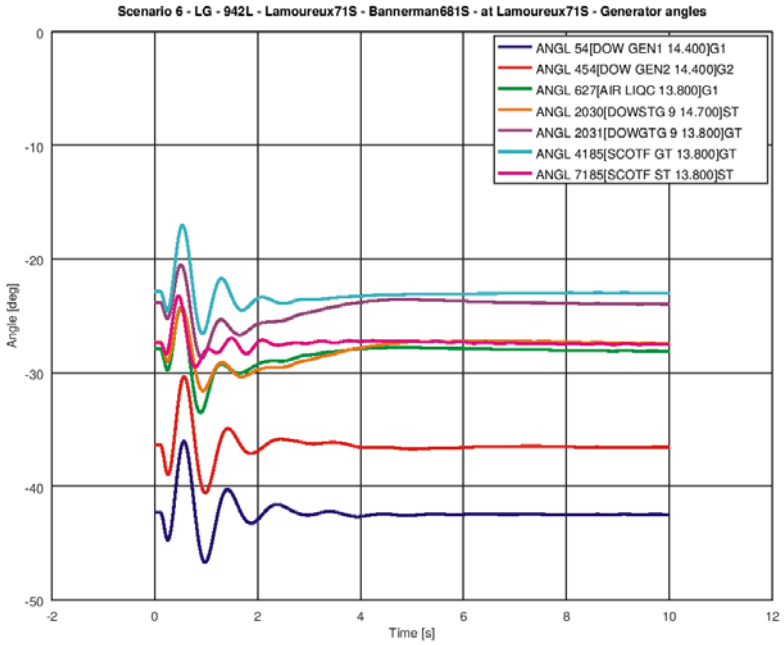


Figure A-276 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

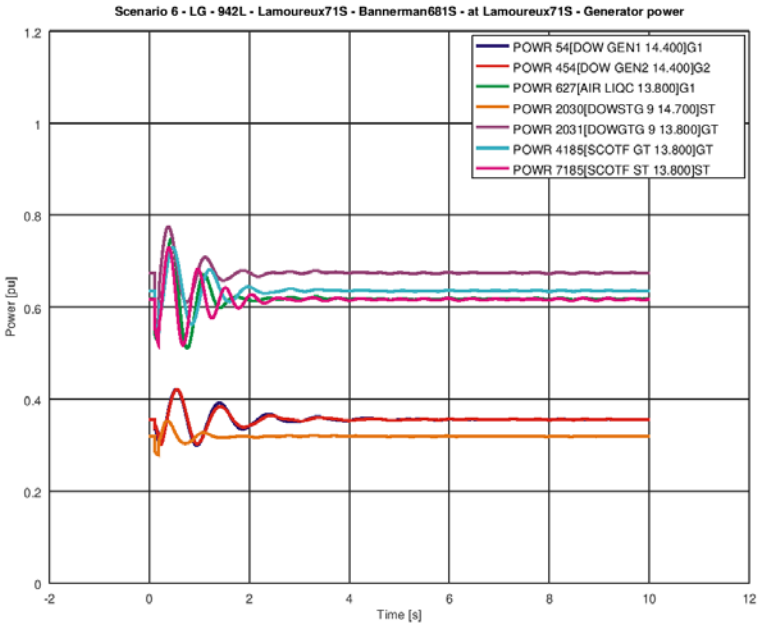


Figure A-277 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

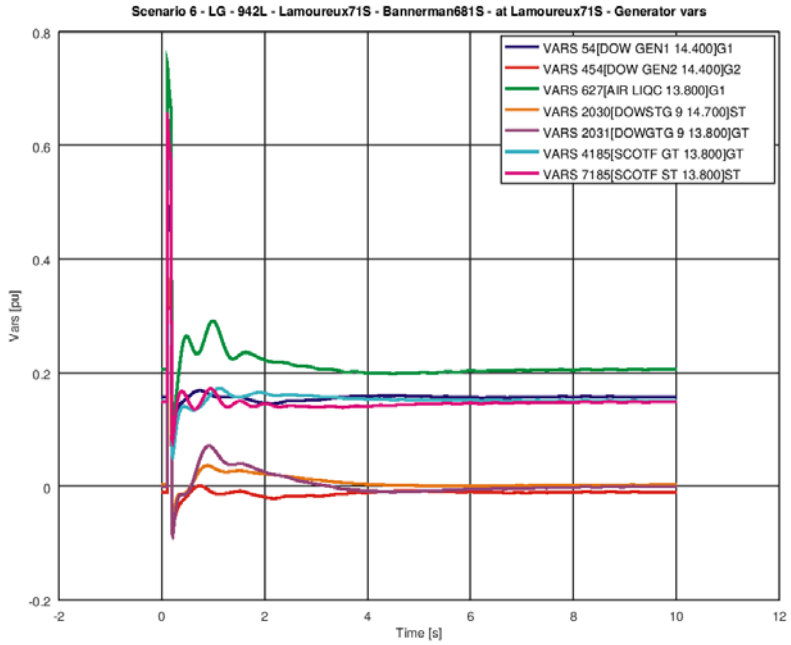


Figure A-278 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

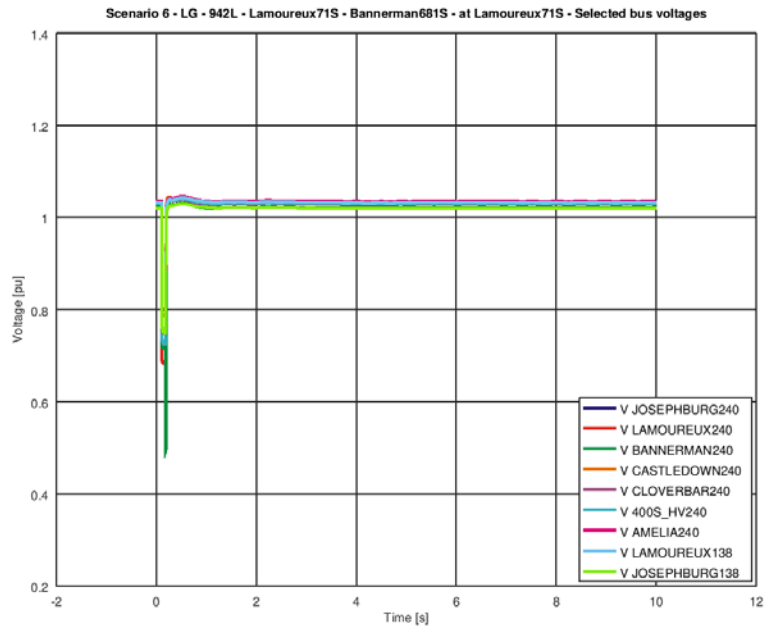


Figure A-279 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

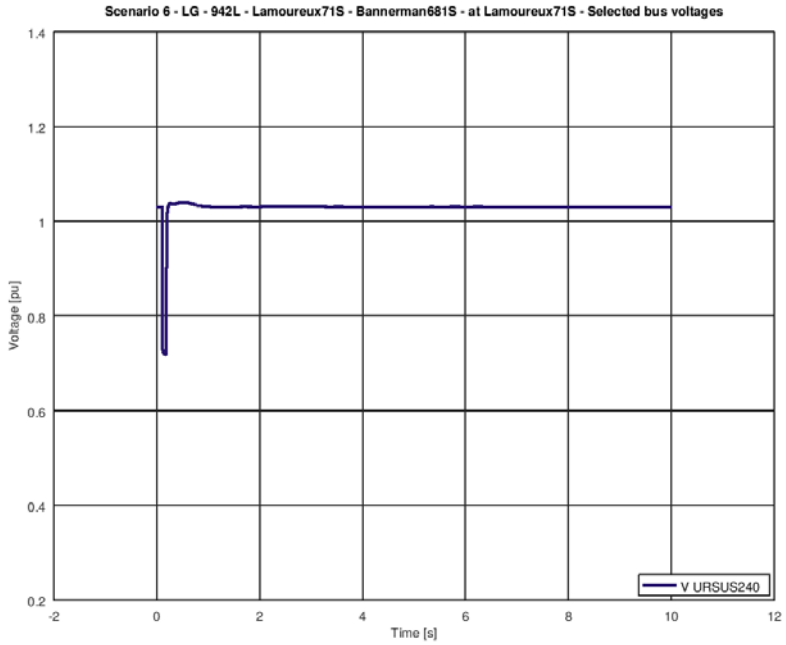


Figure A-280 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

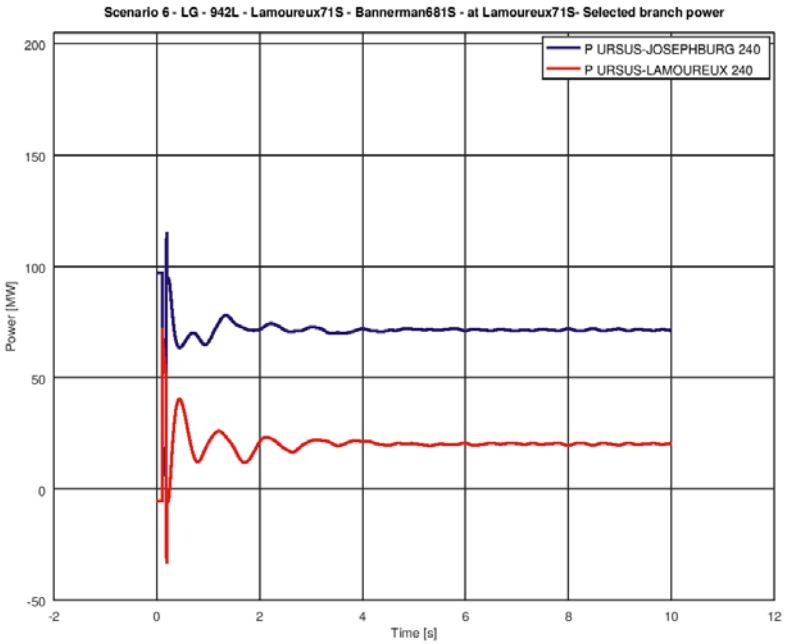


Figure A-281 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

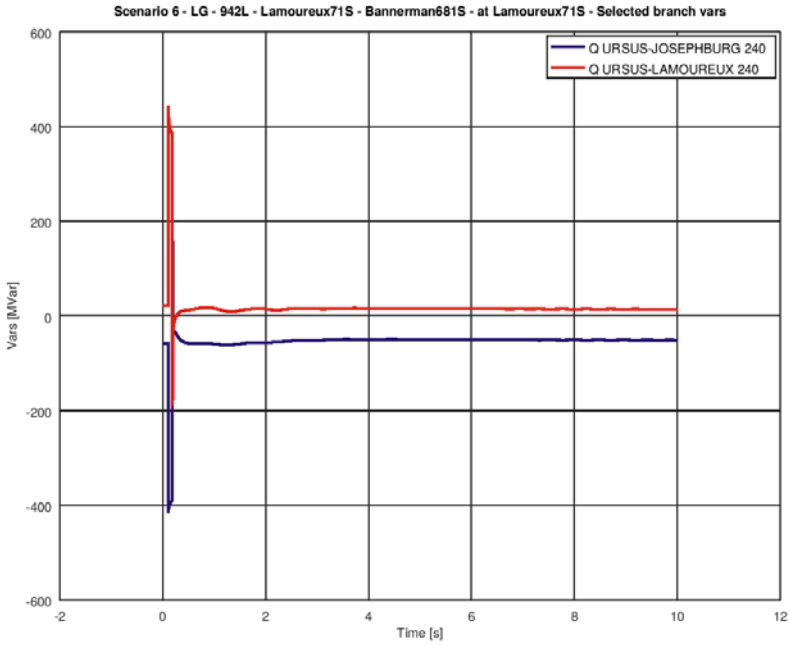


Figure A-282 Scenario 6 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

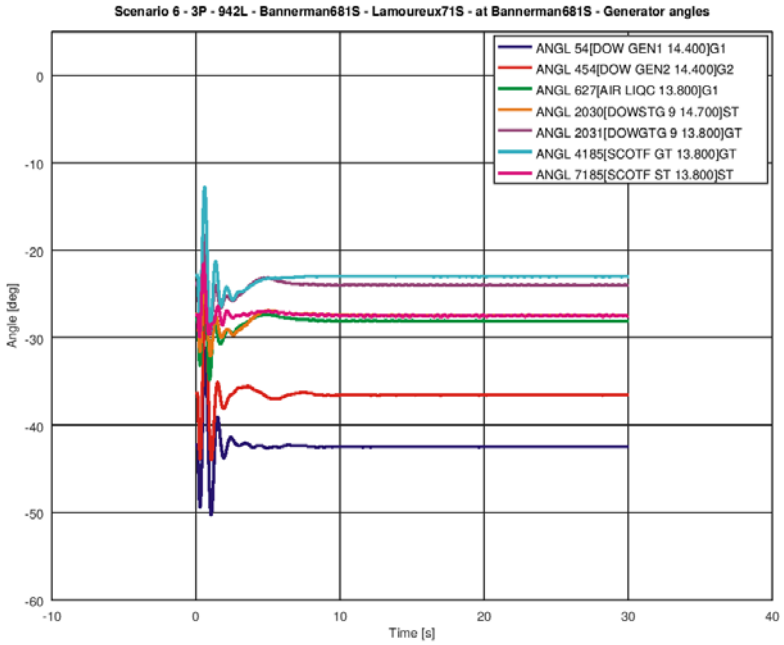


Figure A-283 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

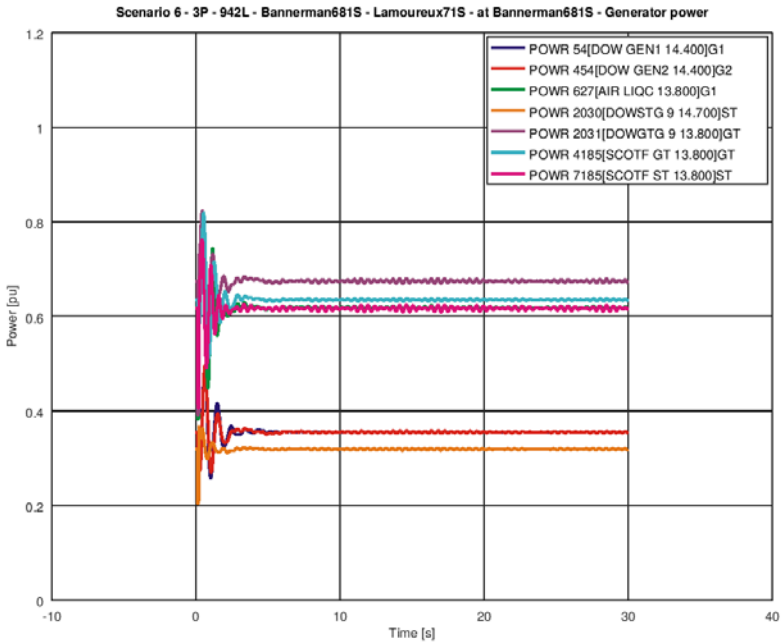


Figure A-284 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

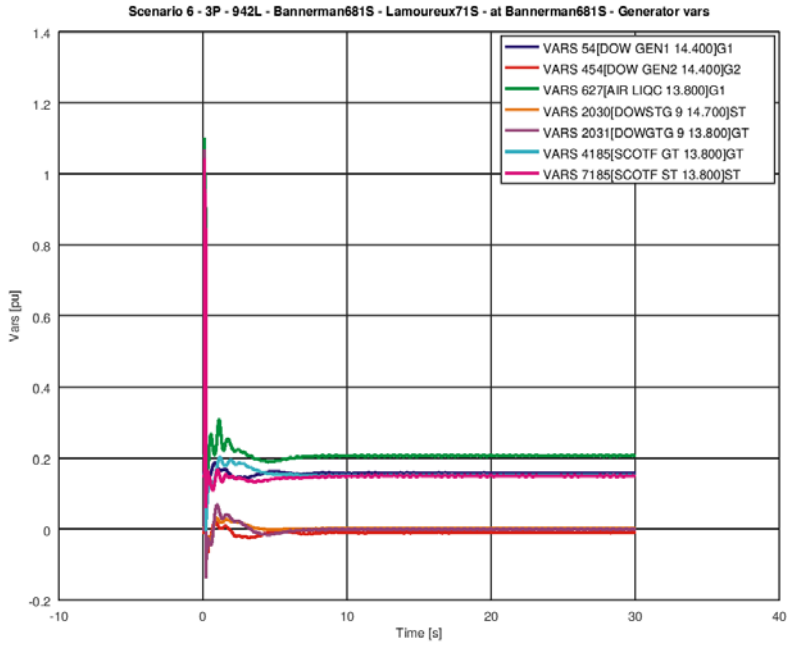


Figure A-285 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

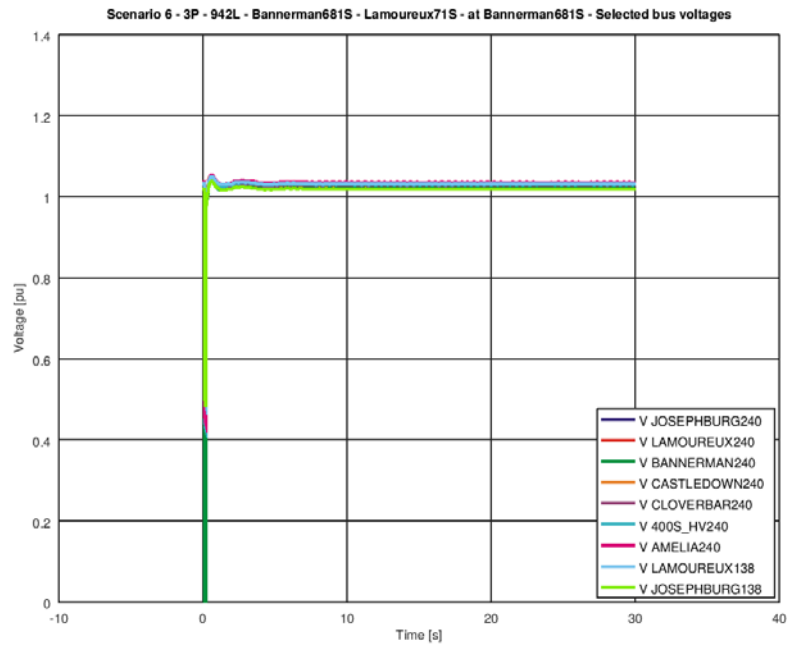


Figure A-286 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

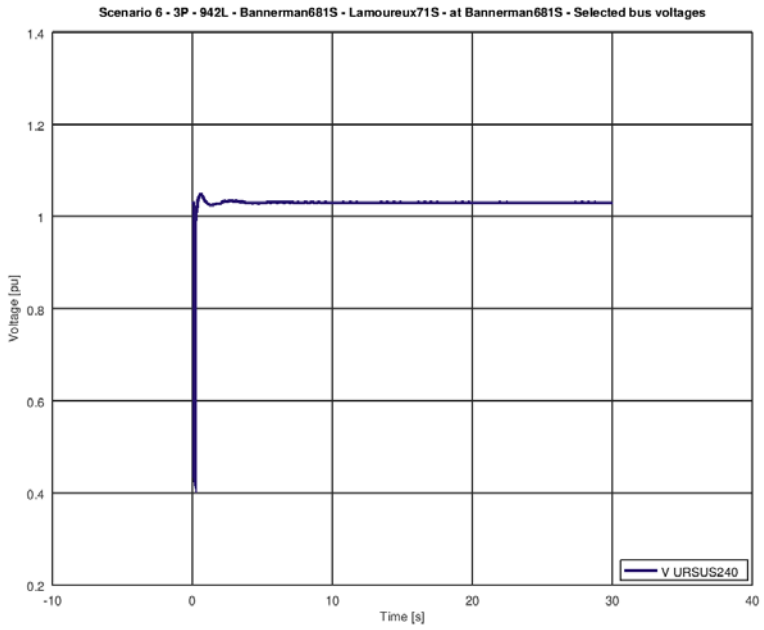


Figure A-287 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

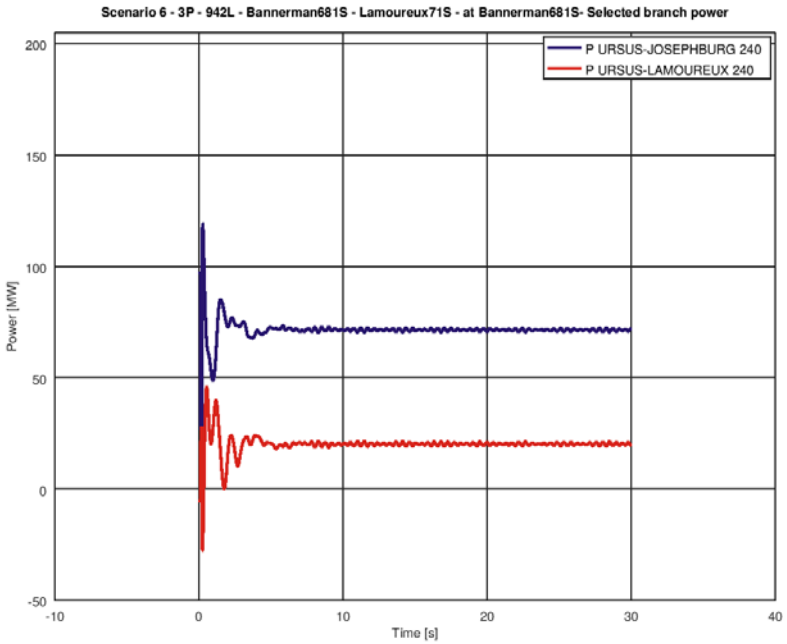


Figure A-288 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

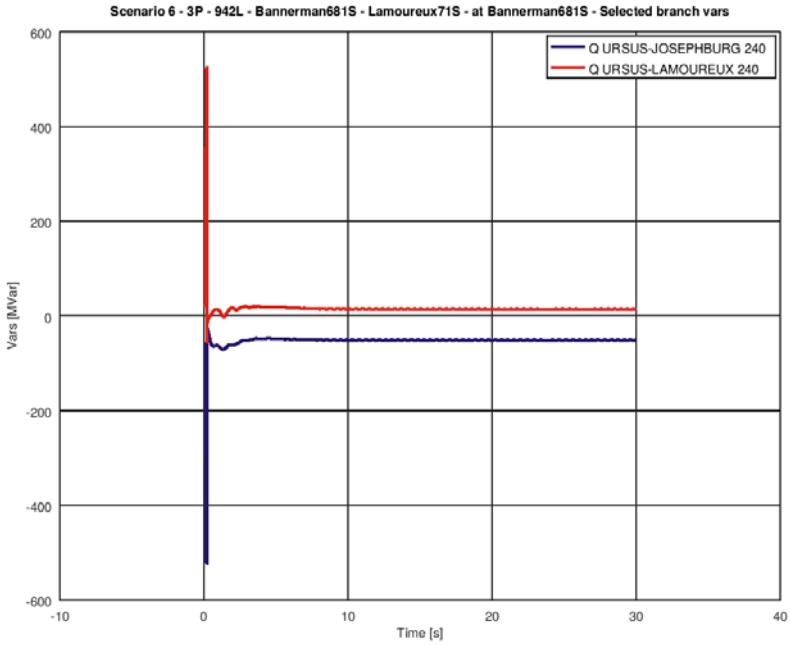


Figure A-289 Scenario 6 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

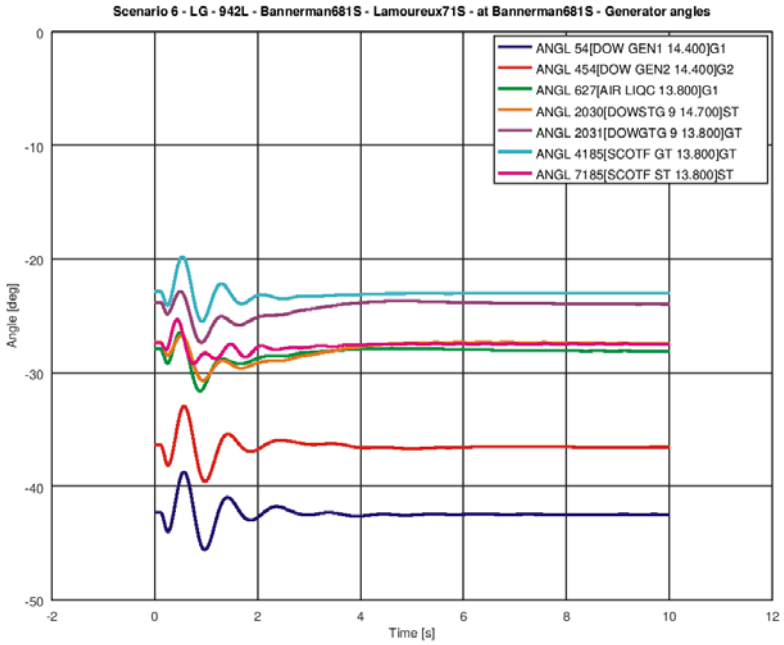


Figure A-290 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

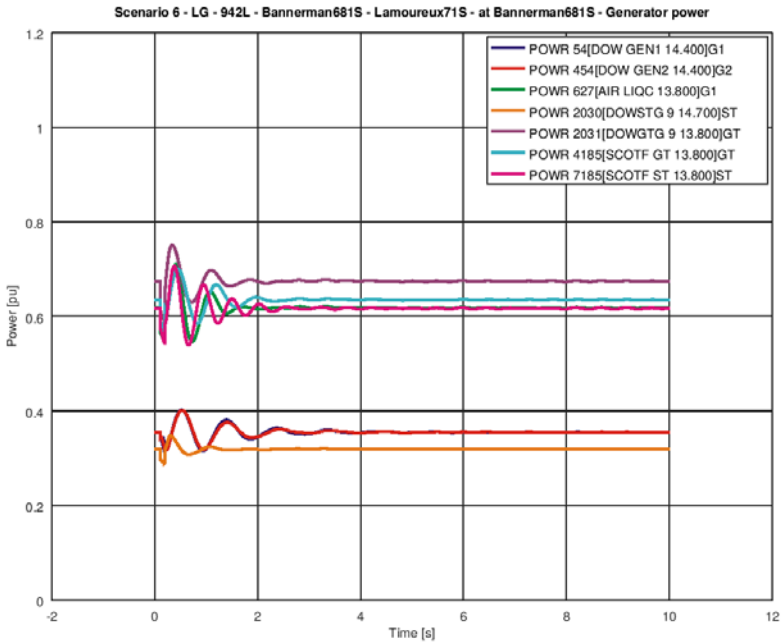


Figure A-291 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

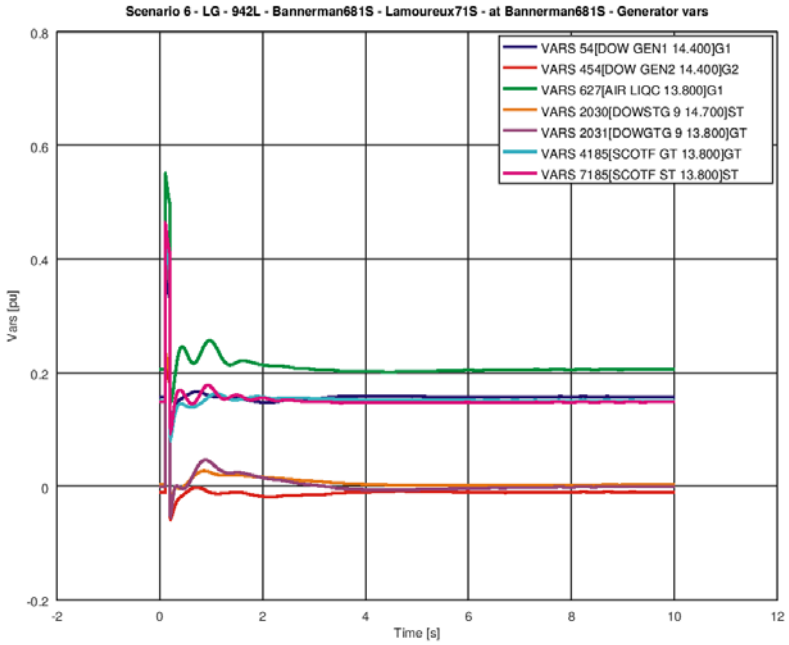


Figure A-292 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

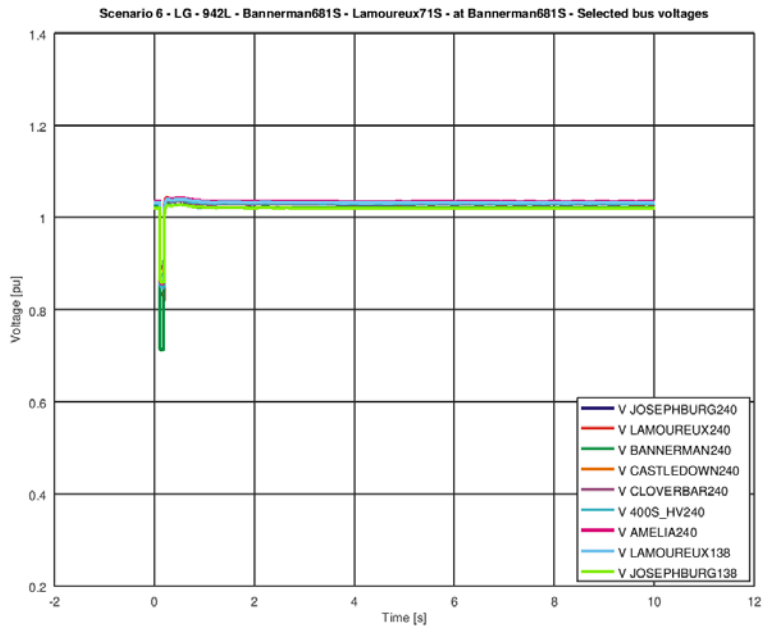


Figure A-293 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

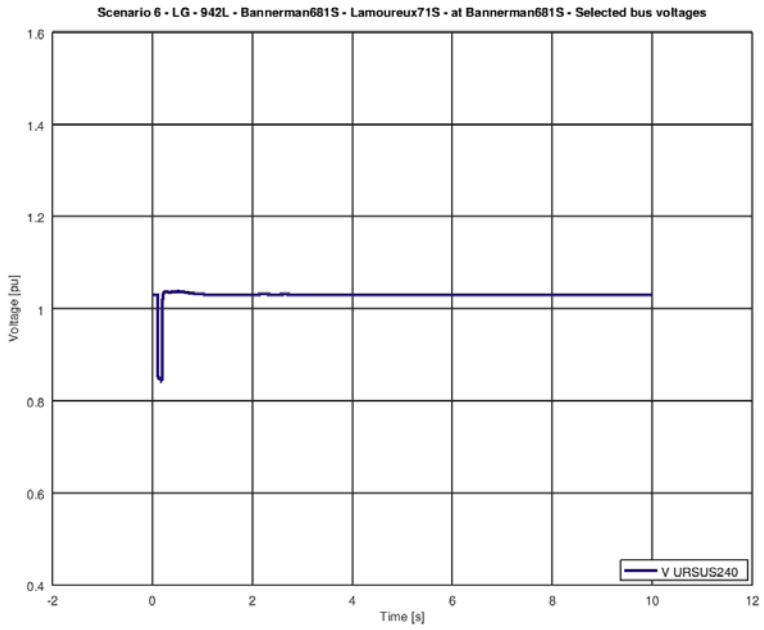


Figure A-294 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

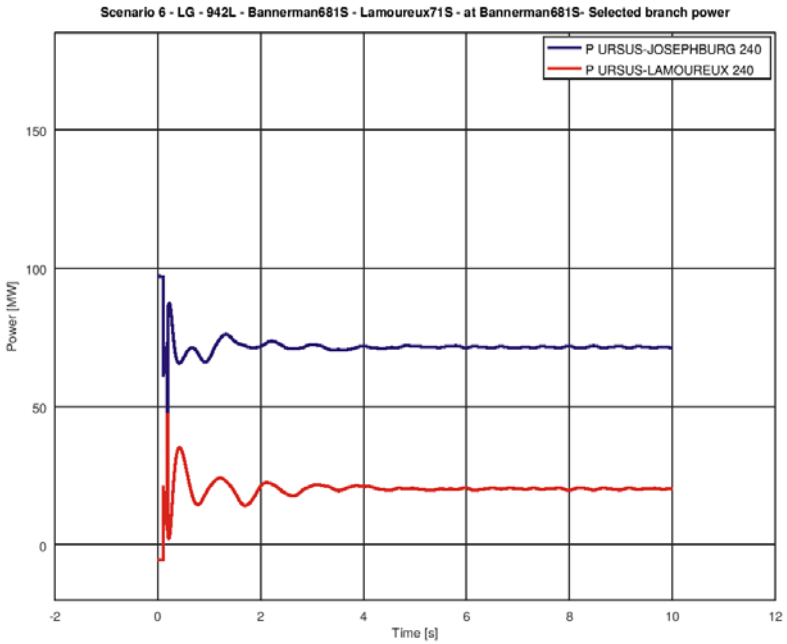


Figure A-295 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

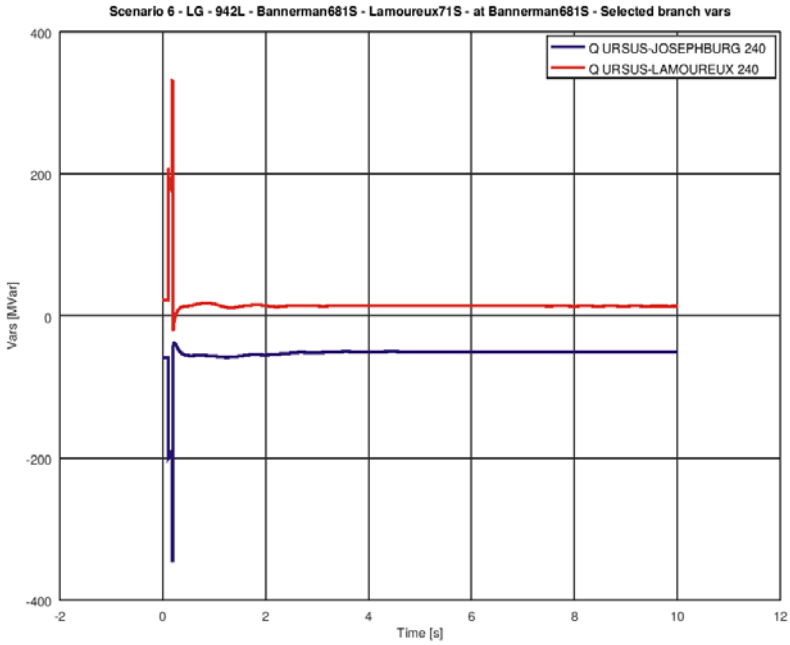


Figure A-296 Scenario 6 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

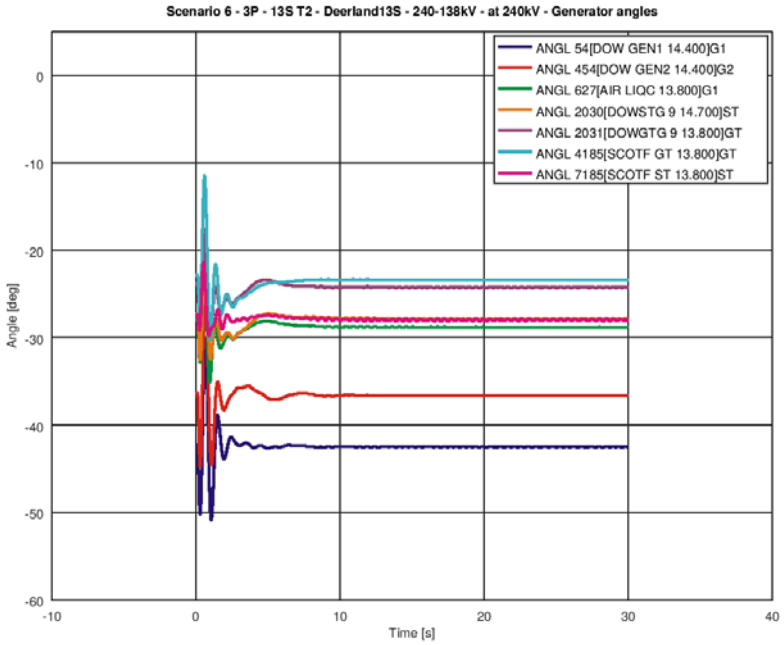


Figure A-297 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

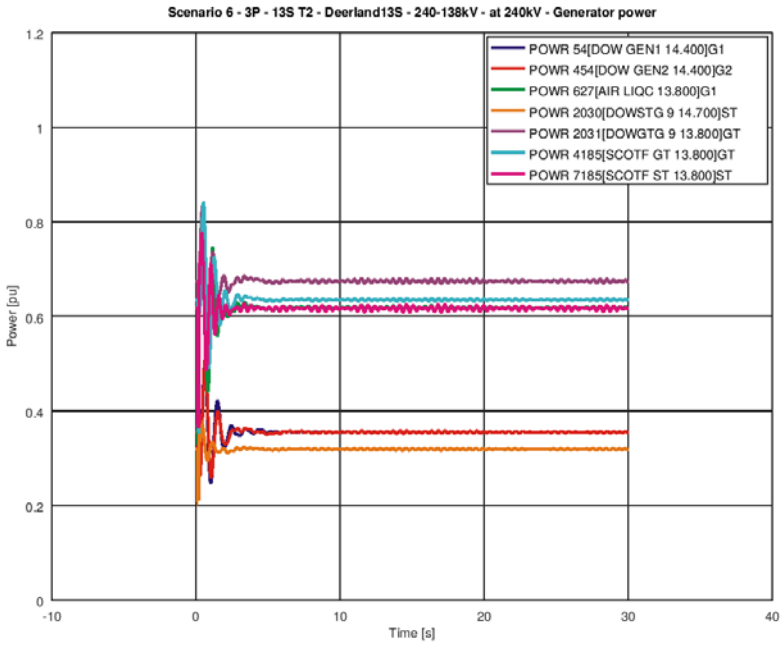


Figure A-298 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

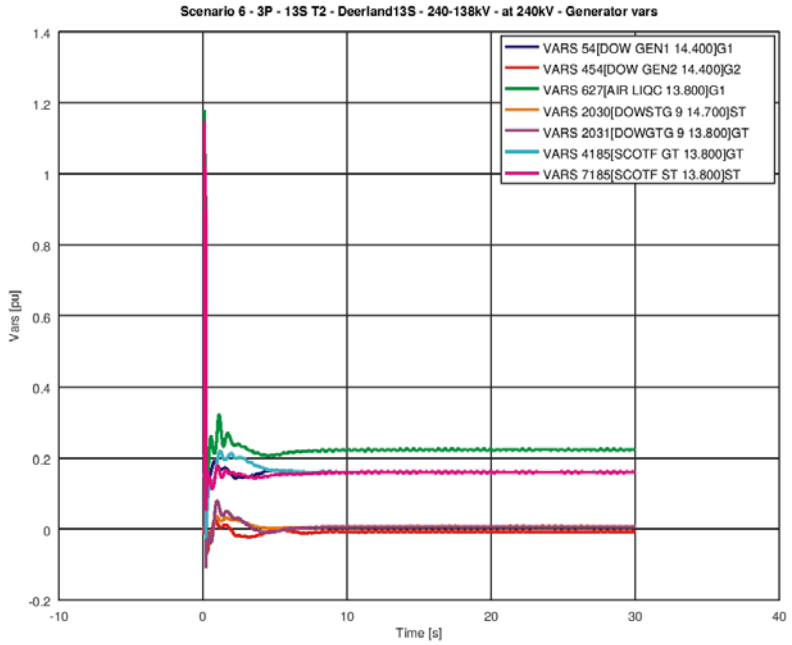


Figure A-299 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

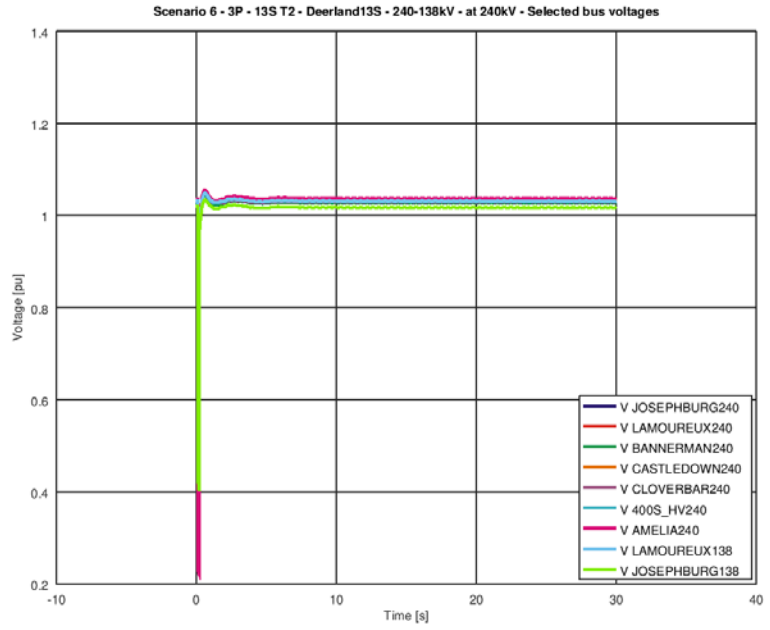


Figure A-300 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

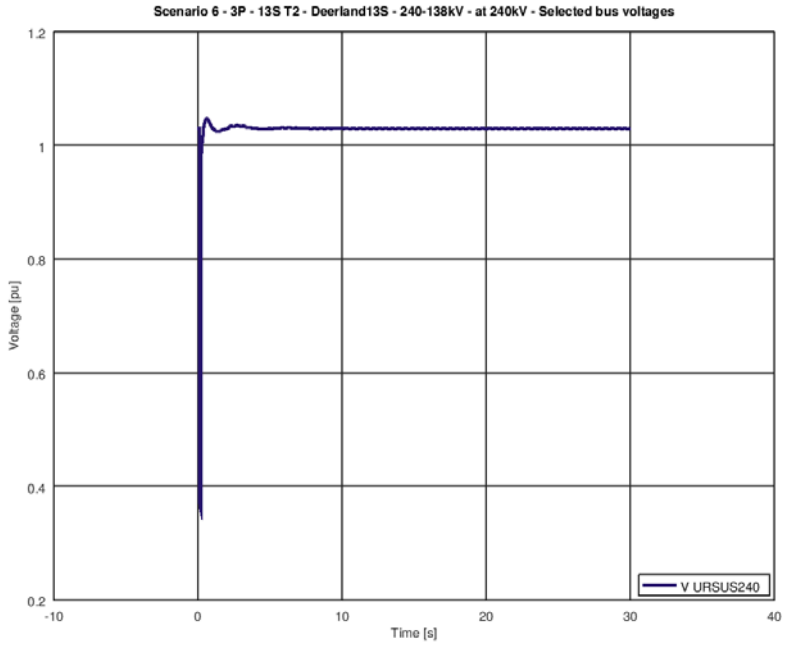


Figure A-301 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

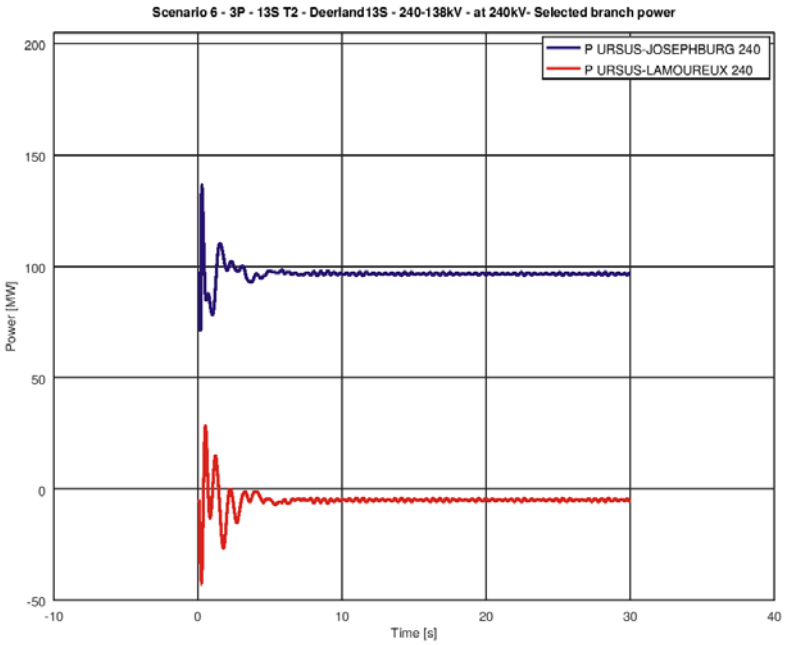


Figure A-302 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch power

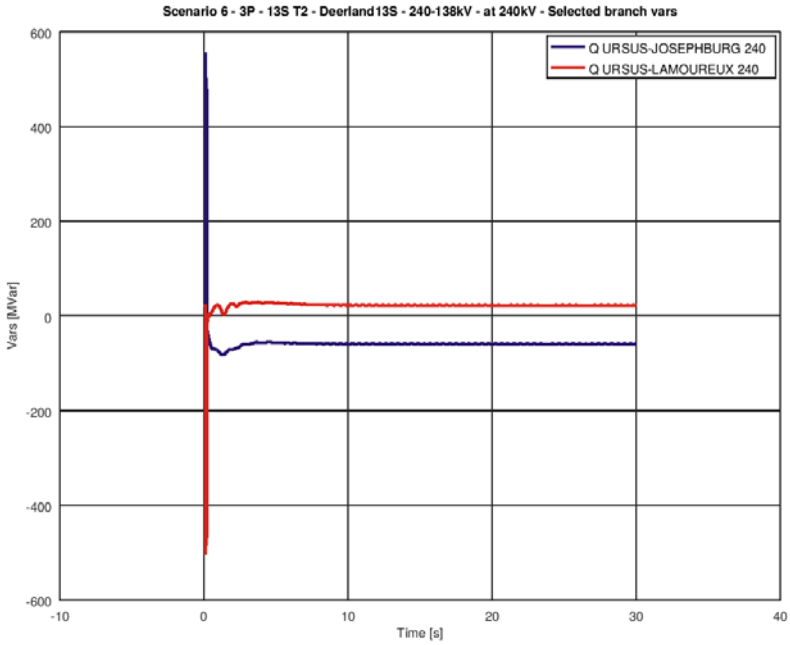


Figure A-303 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch vars

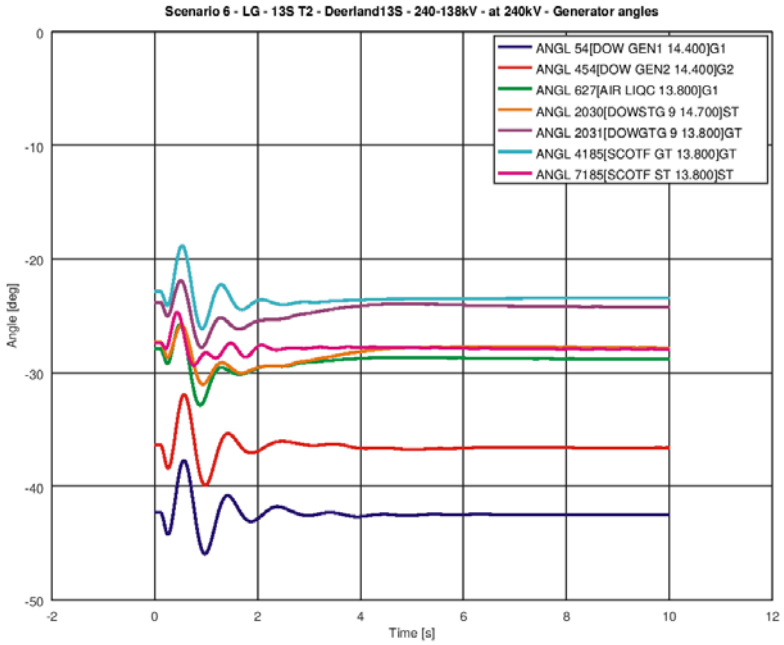


Figure A-304 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

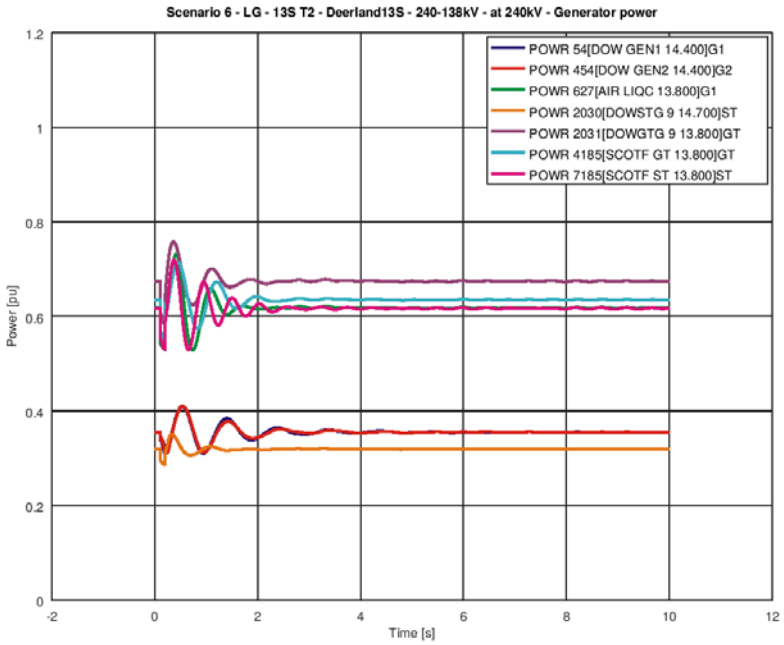


Figure A-305 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

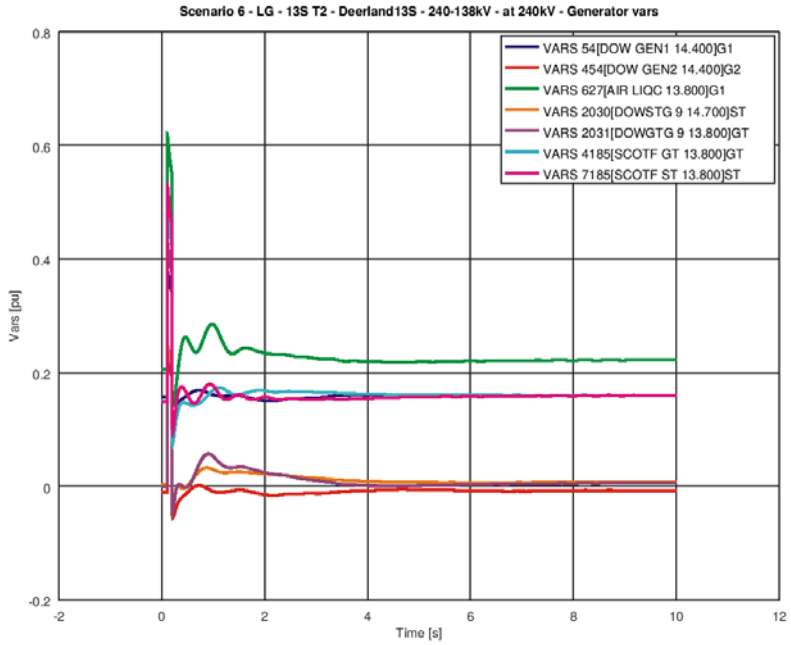


Figure A-306 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

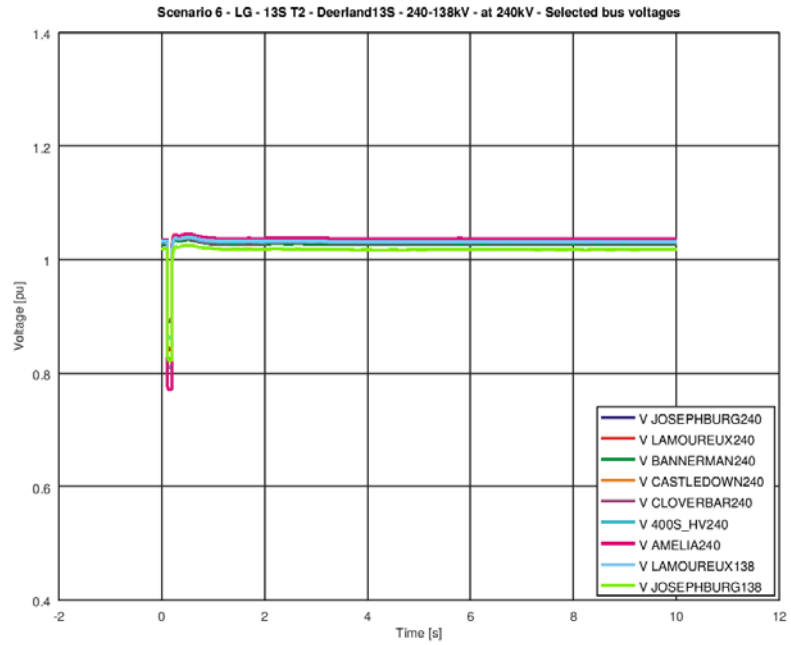


Figure A-307 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

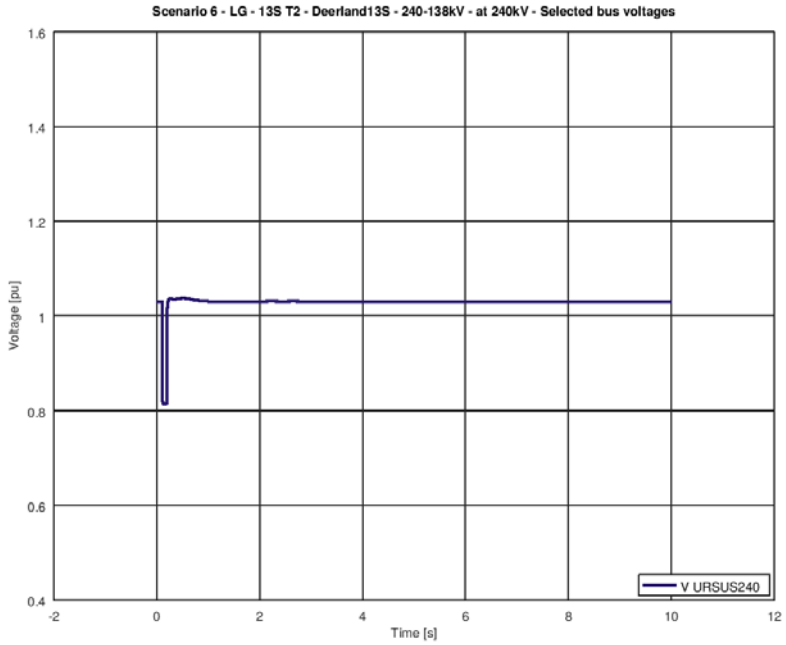


Figure A-308 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

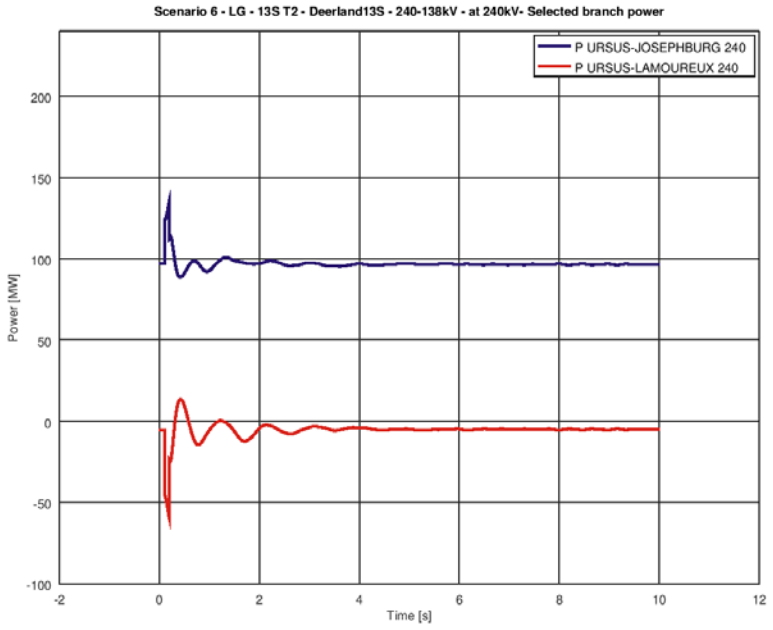


Figure A-309 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch power

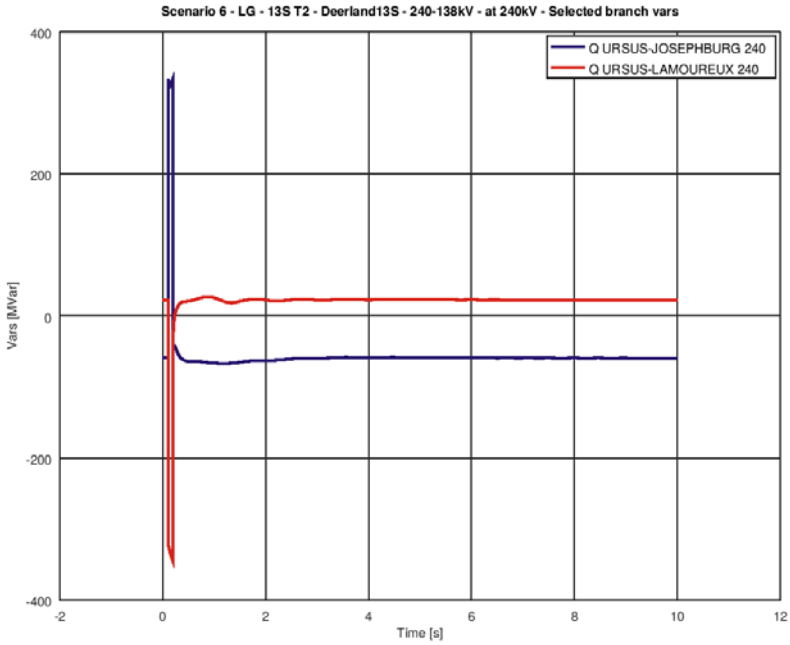


Figure A-310 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch vars

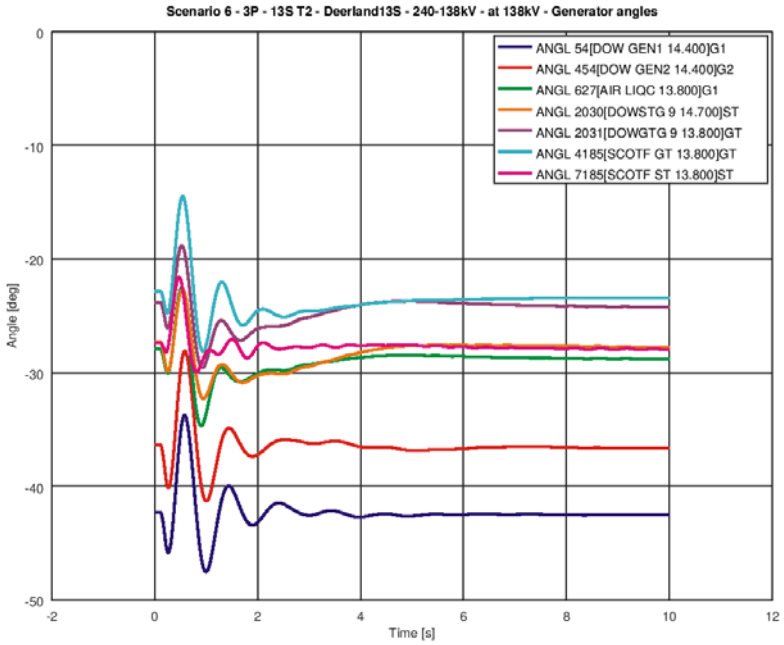


Figure A-311 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

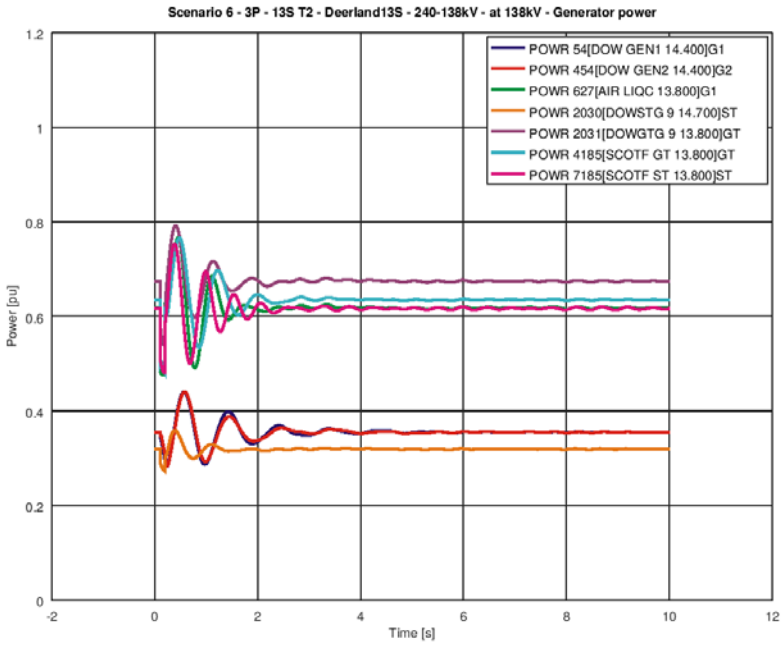


Figure A-312 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

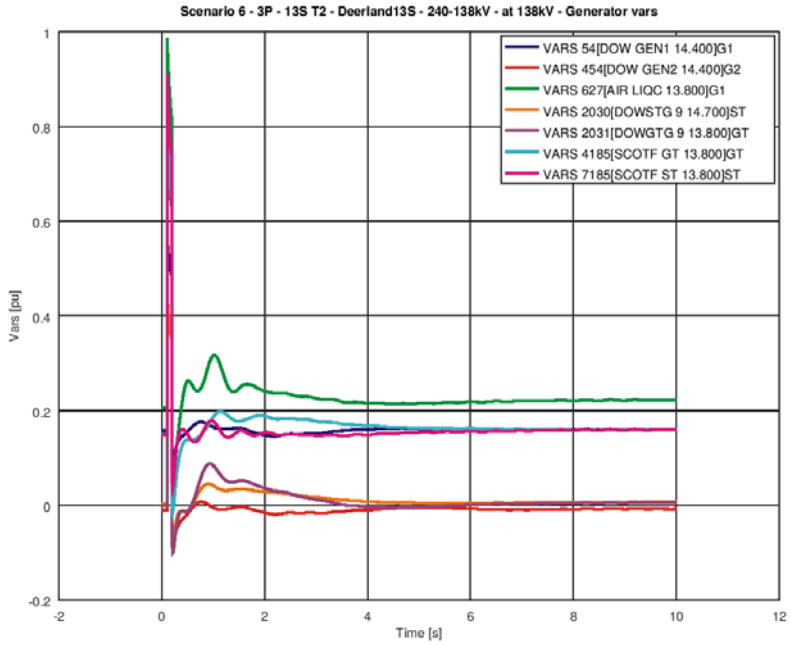


Figure A-313 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

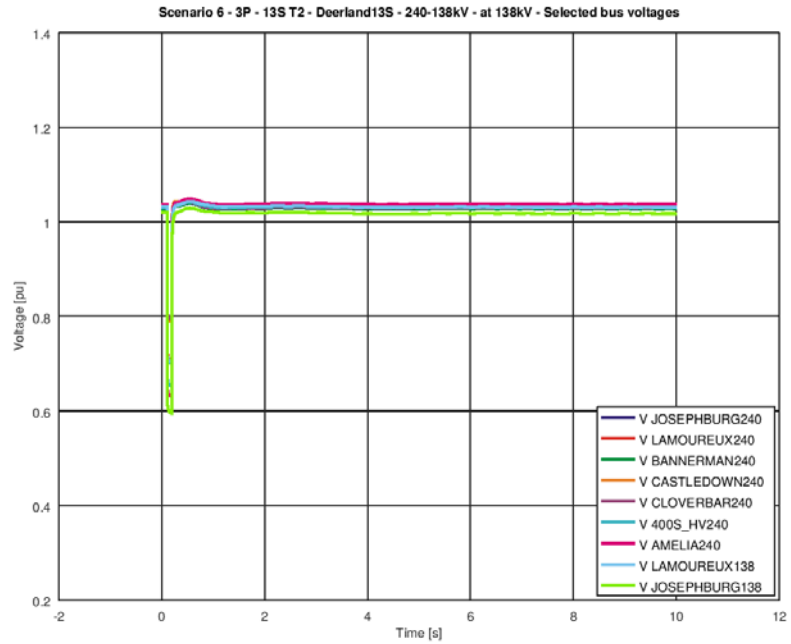


Figure A-314 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

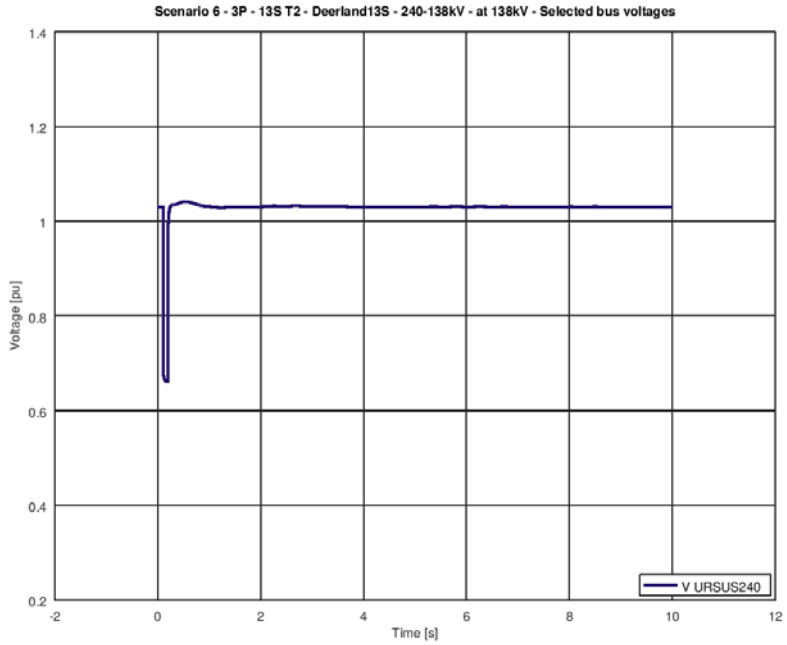


Figure A-315 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

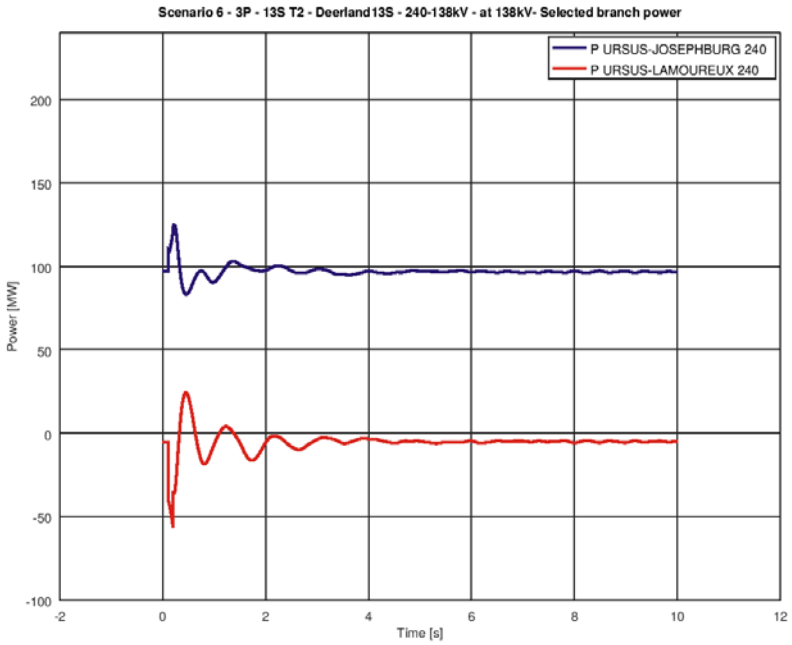


Figure A-316 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch power

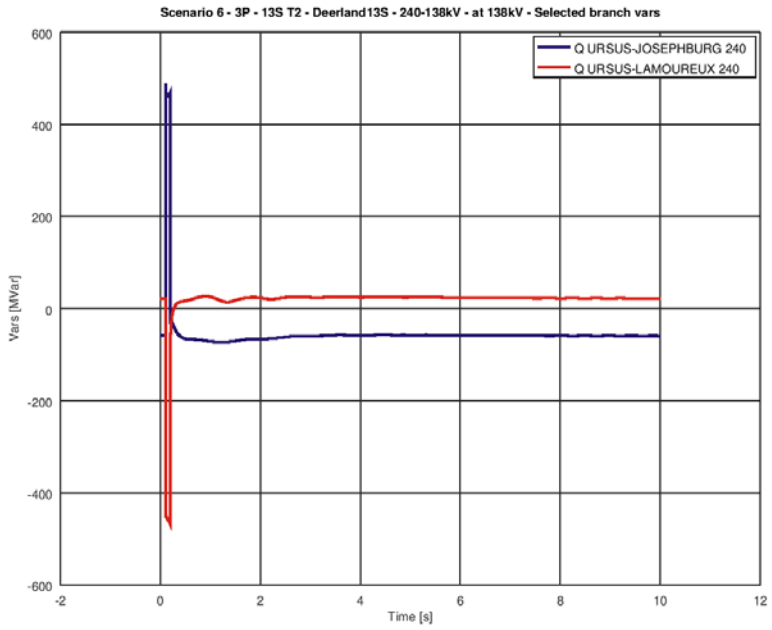


Figure A-317 Scenario 6 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch vars

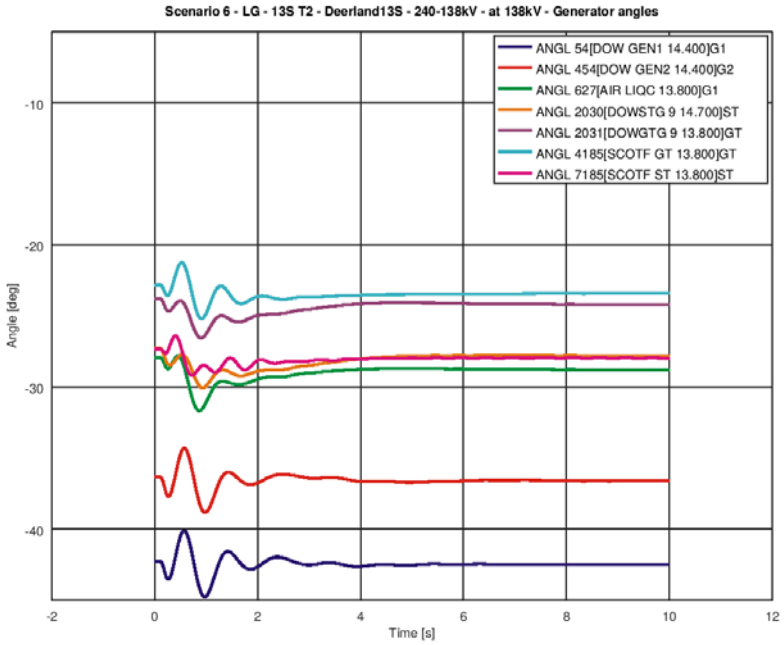


Figure A-318 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

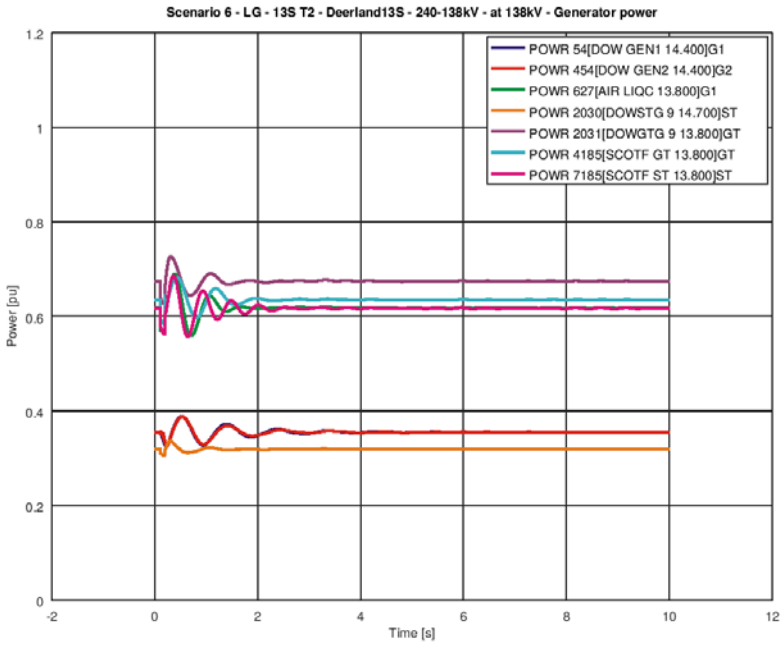


Figure A-319 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

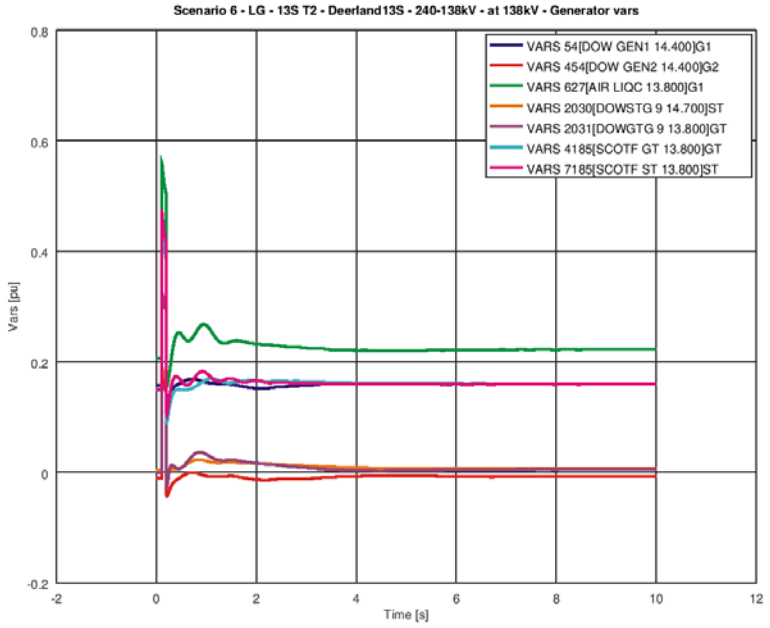


Figure A-320 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

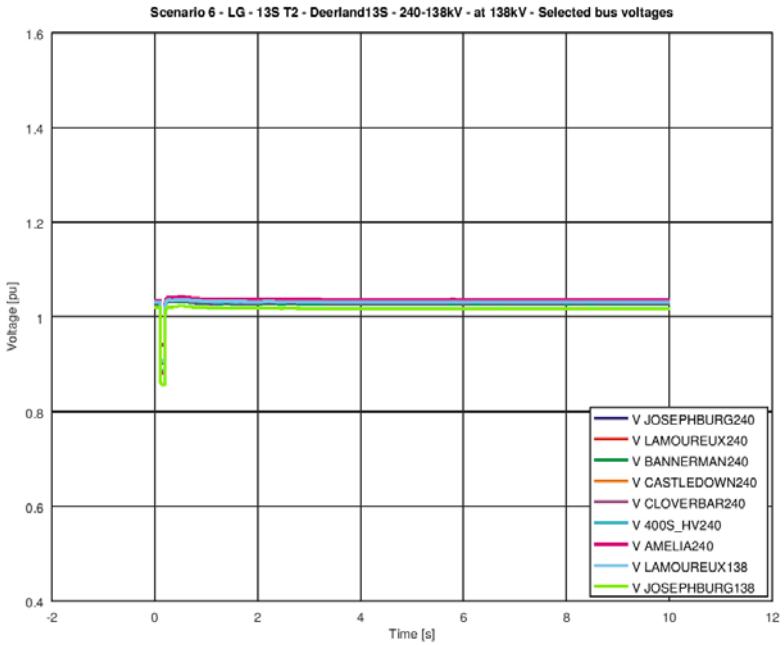


Figure A-321 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

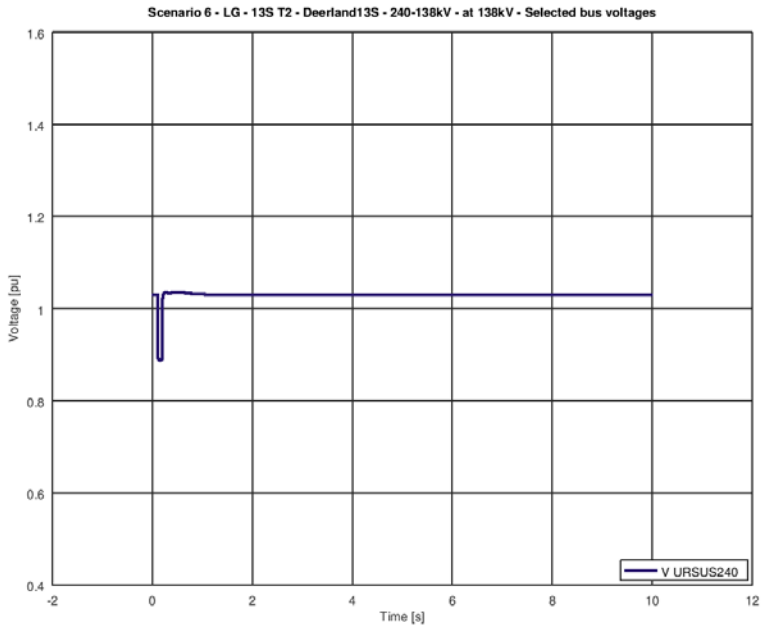


Figure A-322 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

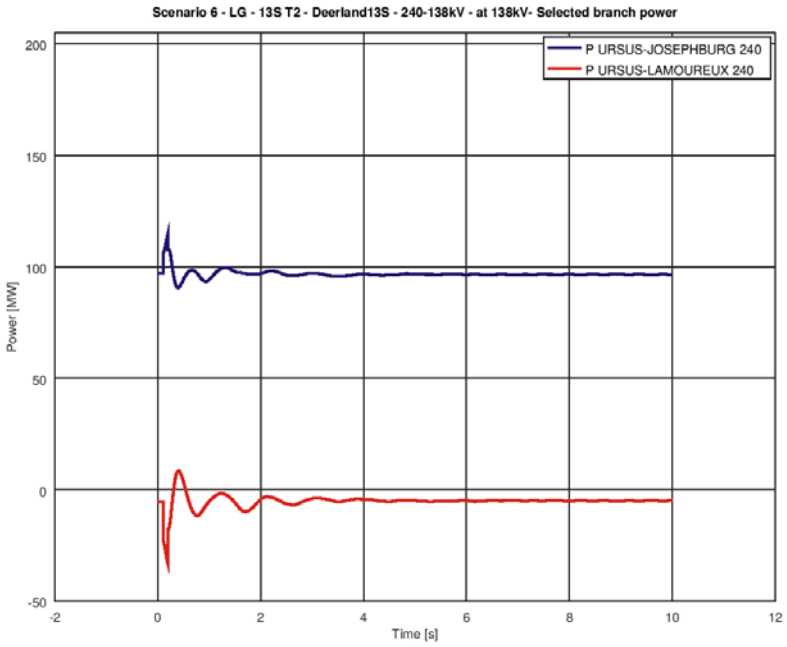


Figure A-323 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch power

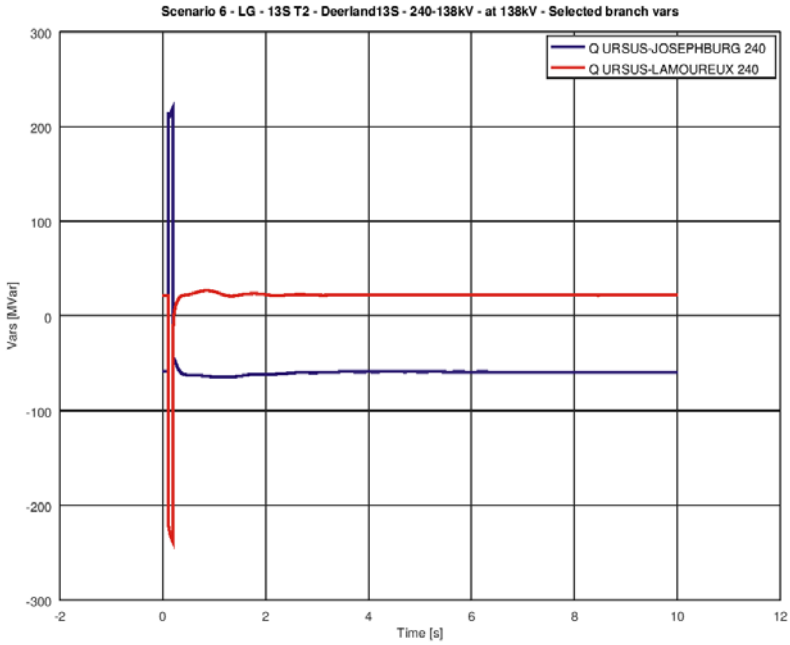


Figure A-324 Scenario 6 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch vars

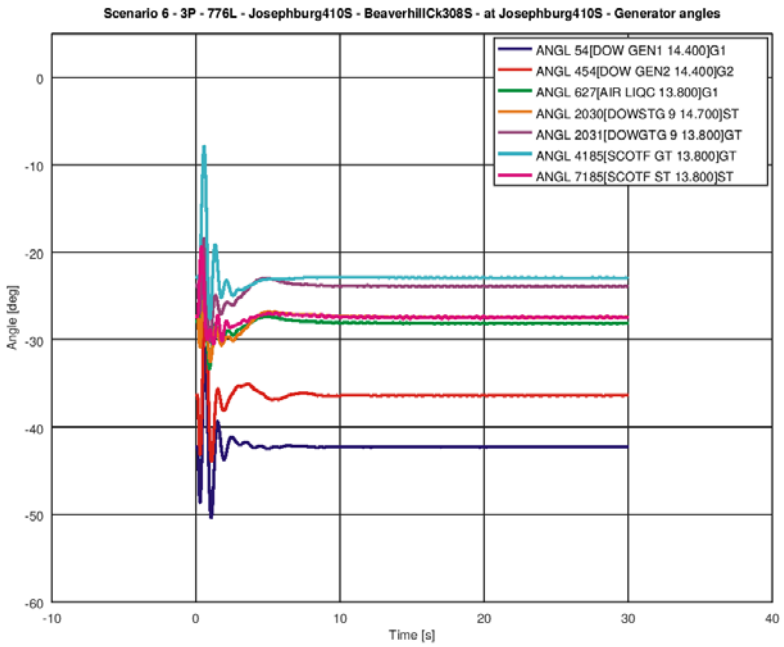


Figure A-325 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

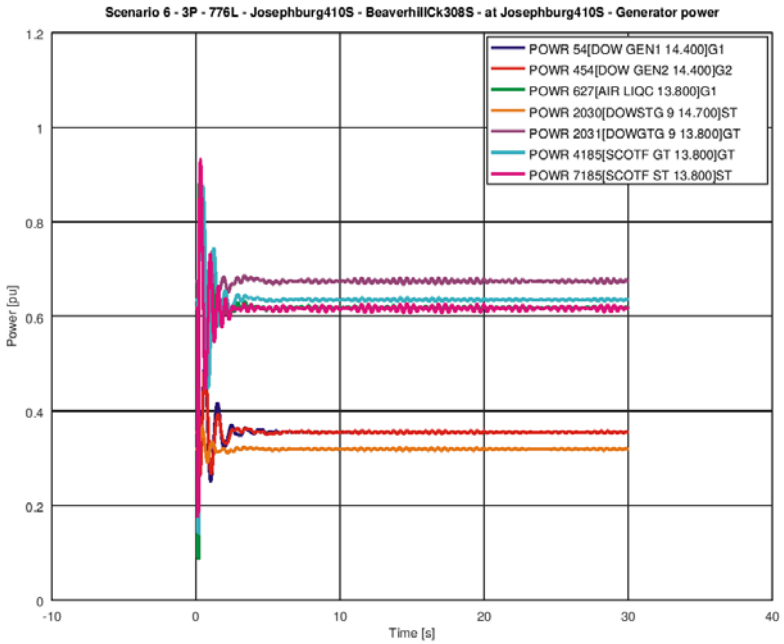


Figure A-326 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

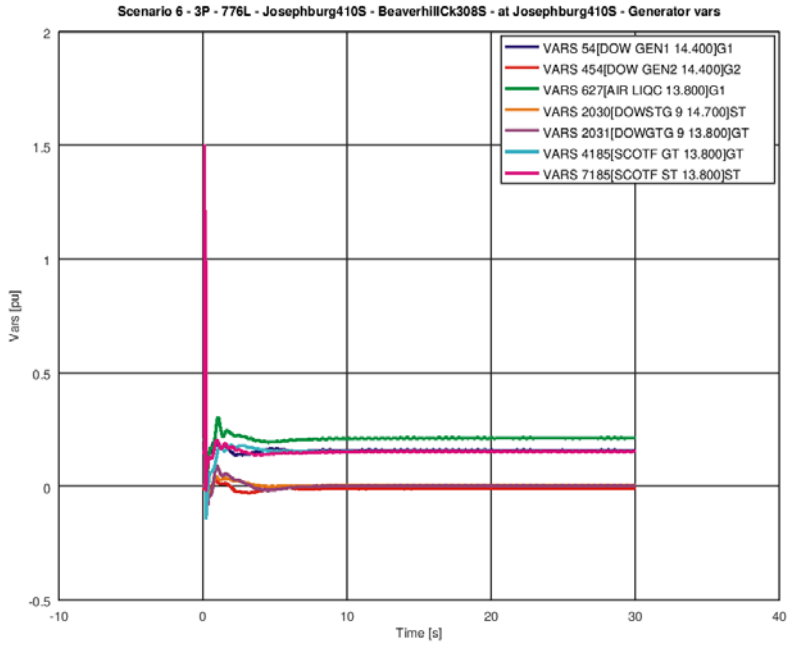


Figure A-327 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

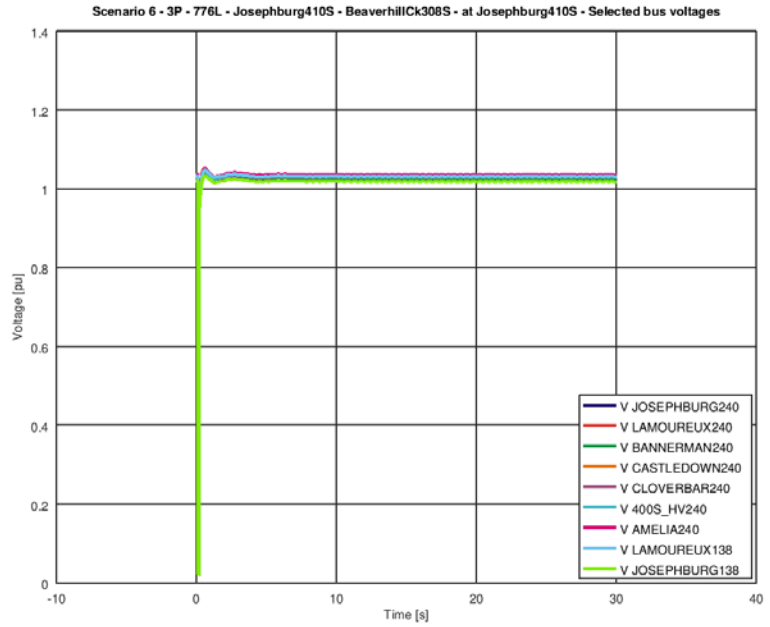


Figure A-328 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

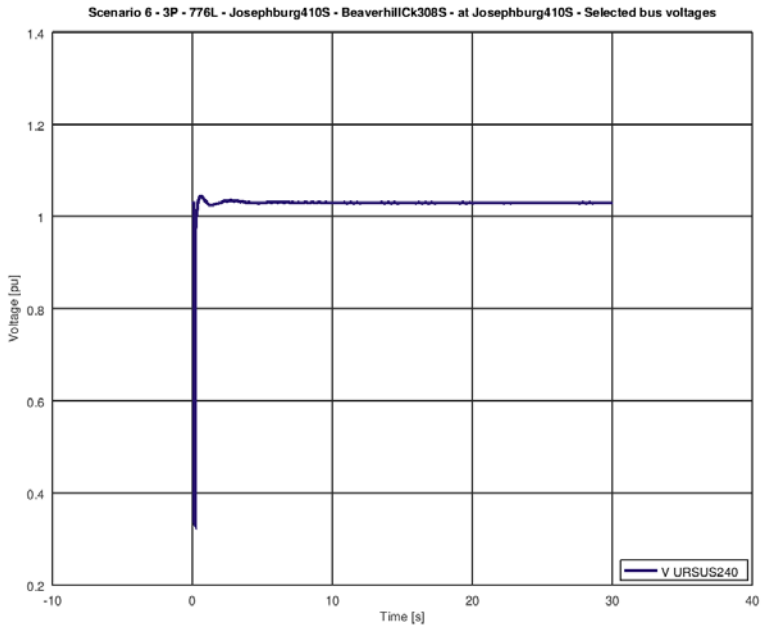


Figure A-329 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

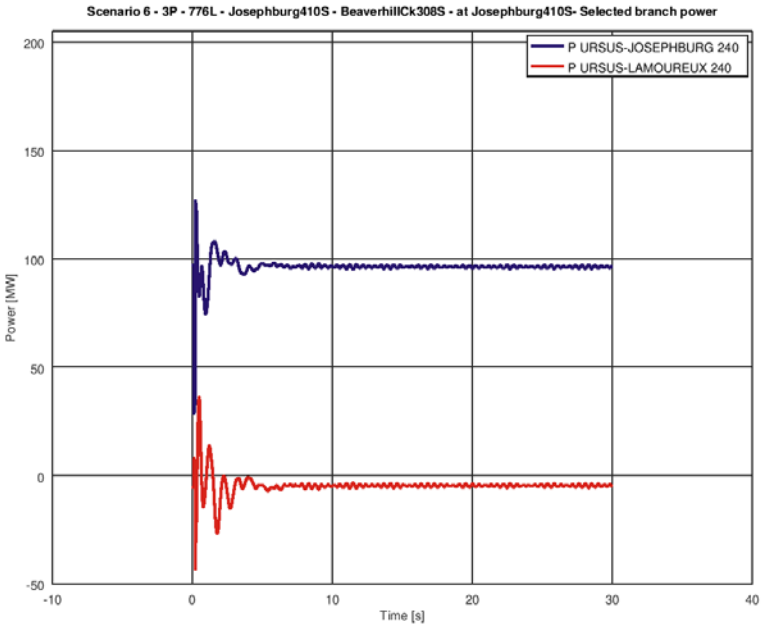


Figure A-330 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

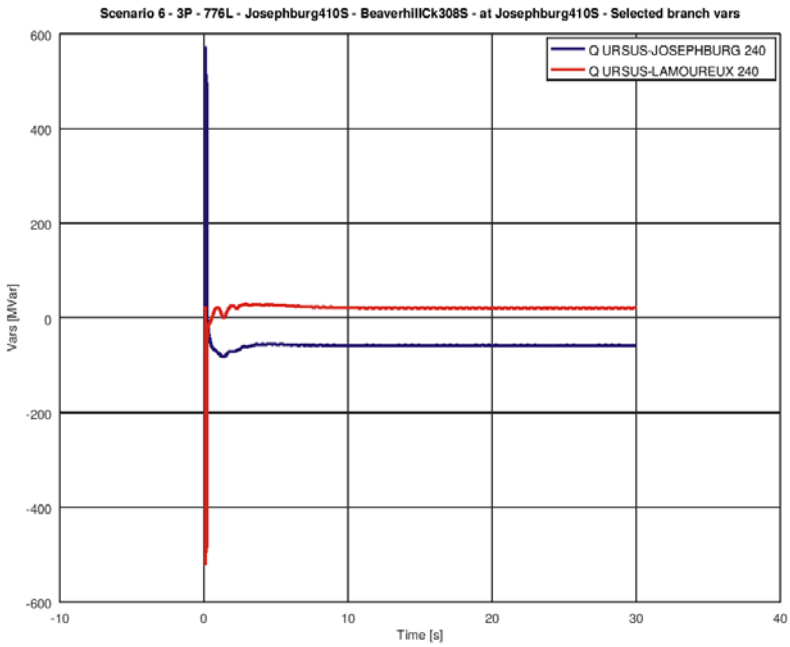


Figure A-331 Scenario 6 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

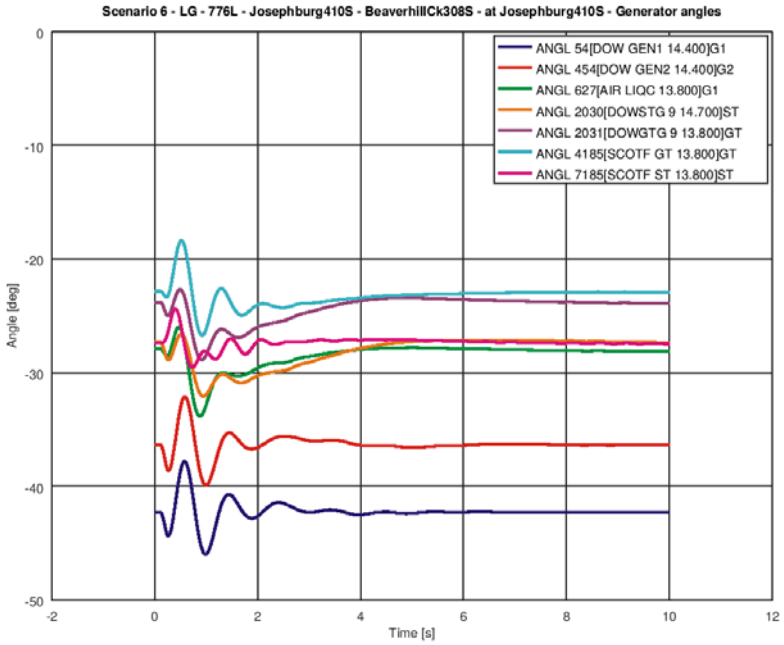


Figure A-332 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

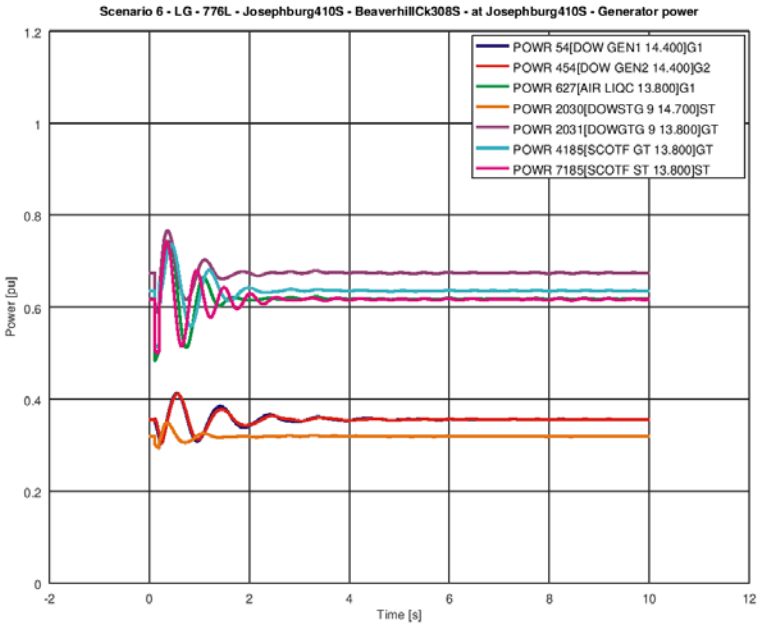


Figure A-333 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

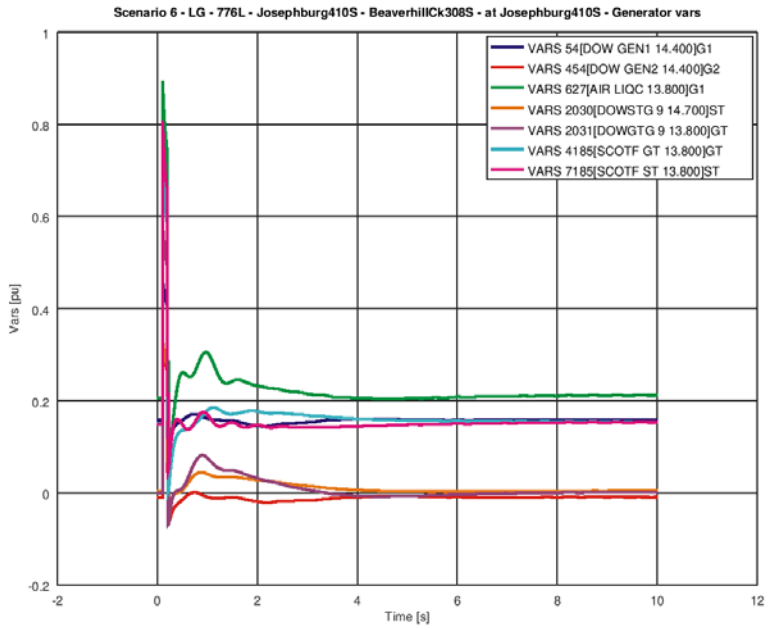


Figure A-334 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

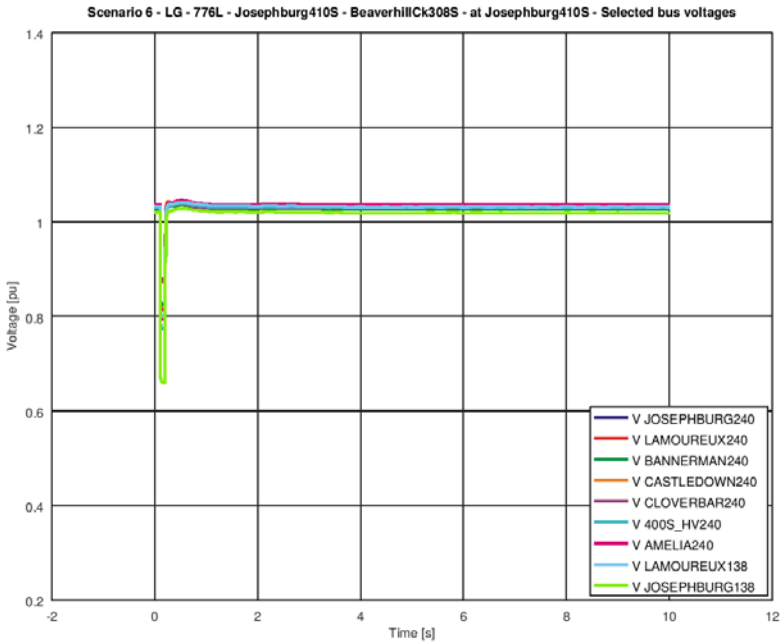


Figure A-335 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

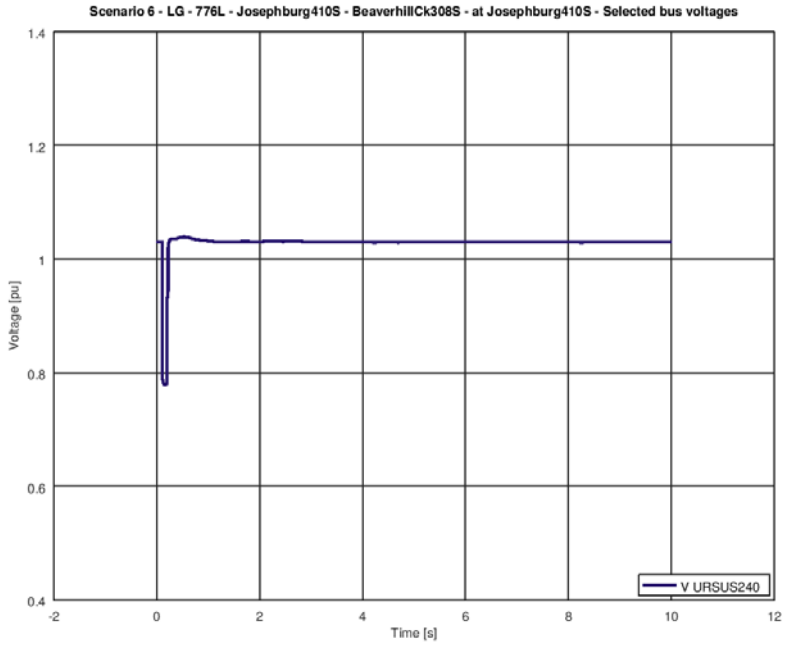


Figure A-336 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

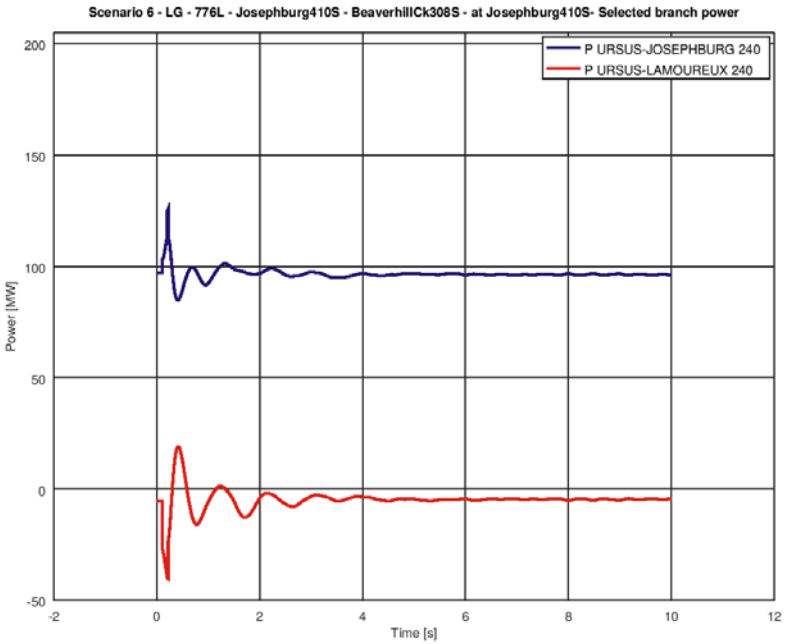


Figure A-337 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

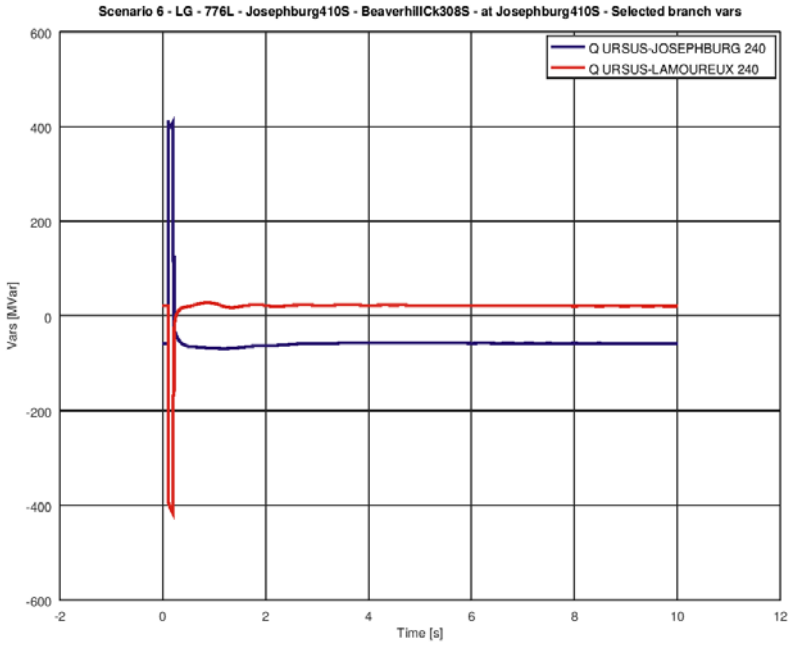


Figure A-338 Scenario 6 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

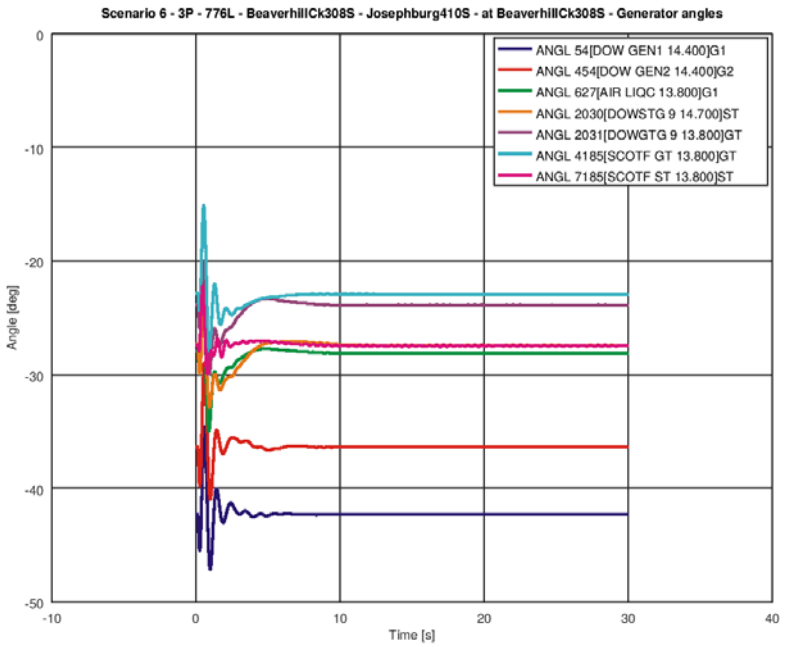


Figure A-339 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

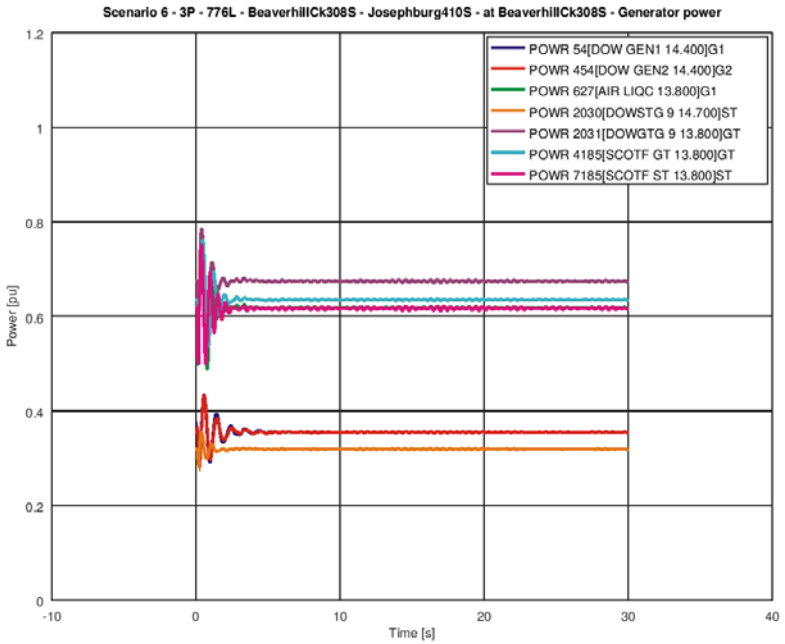


Figure A-340 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

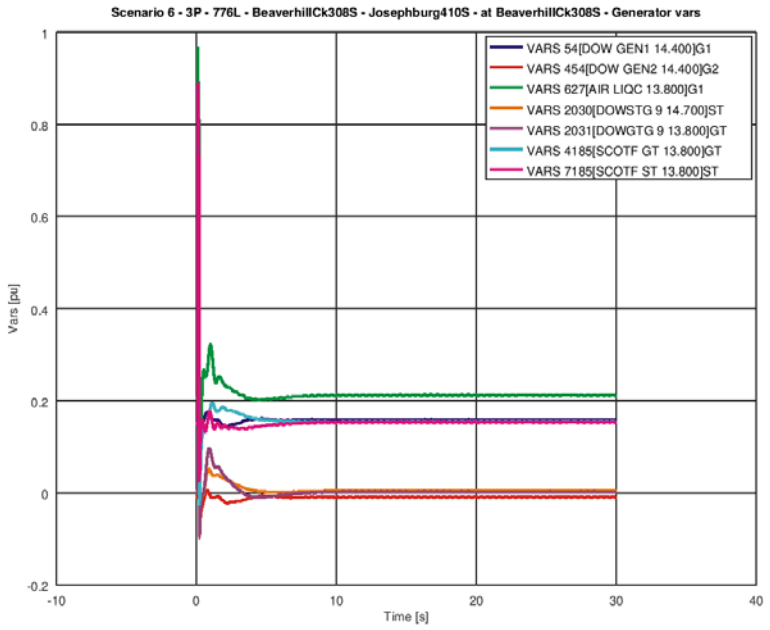


Figure A-341 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

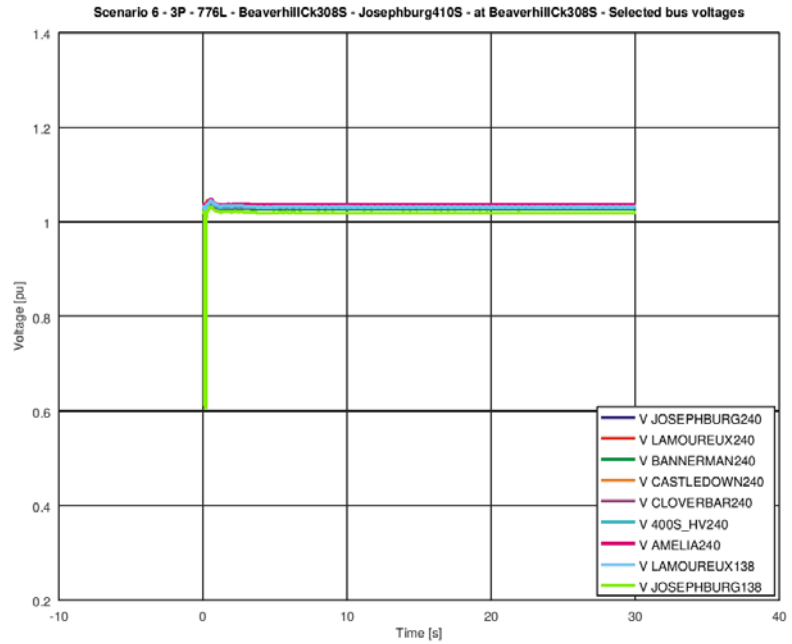


Figure A-342 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

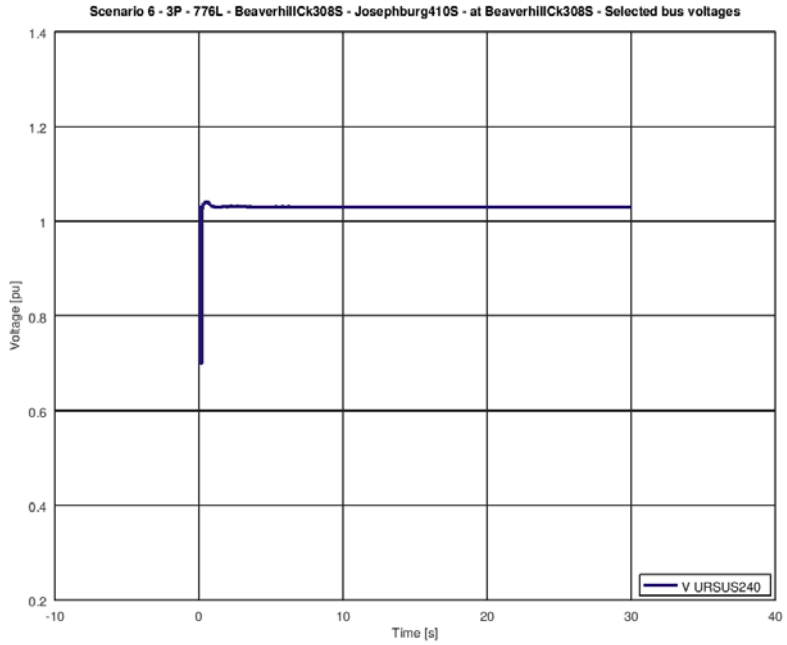


Figure A-343 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

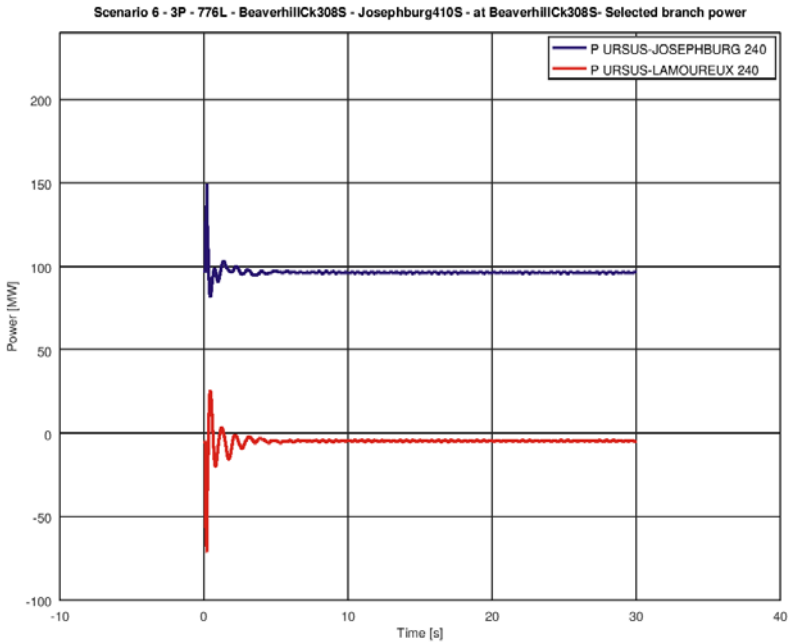


Figure A-344 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

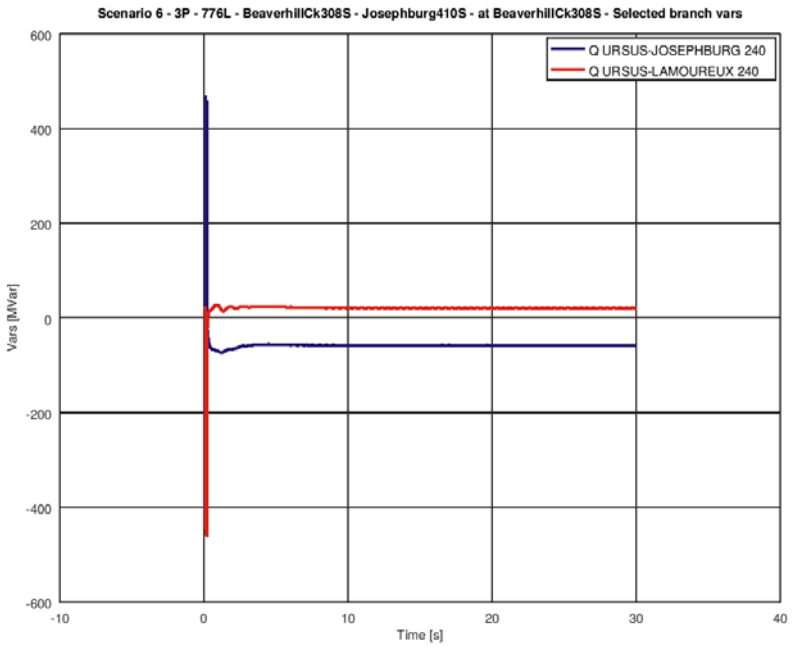


Figure A-345 Scenario 6 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

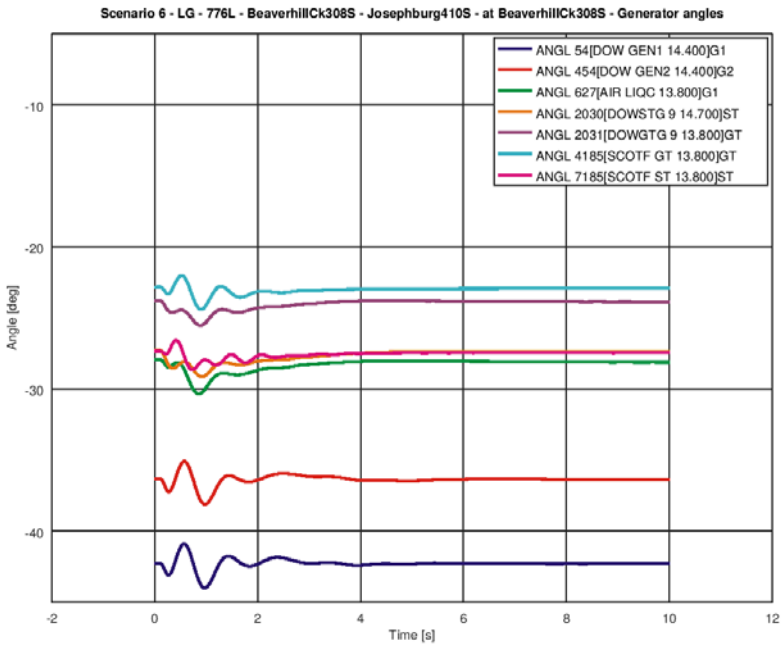


Figure A-346 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

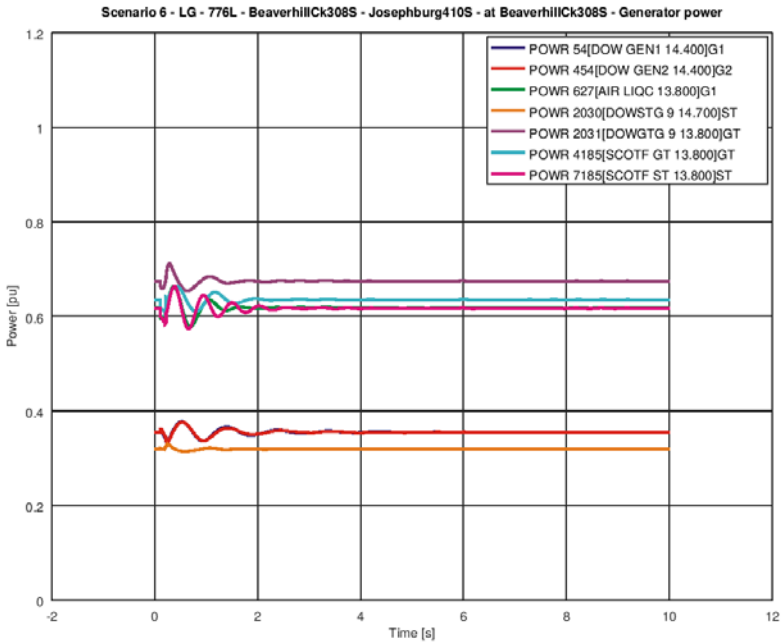


Figure A-347 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

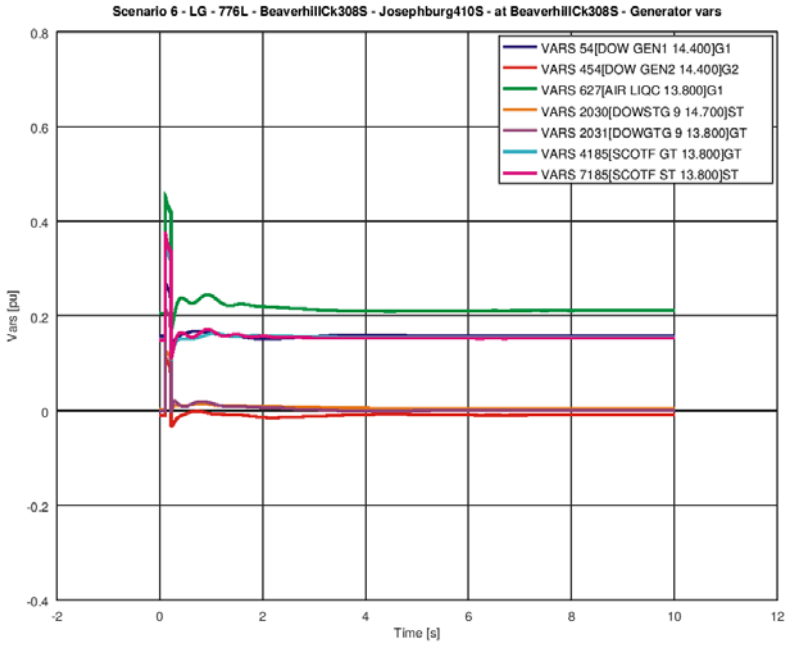


Figure A-348 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

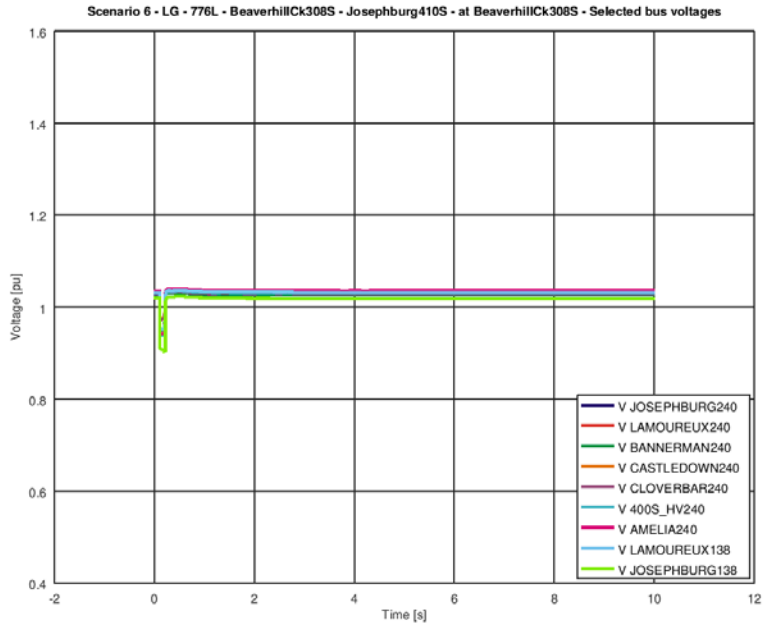


Figure A-349 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

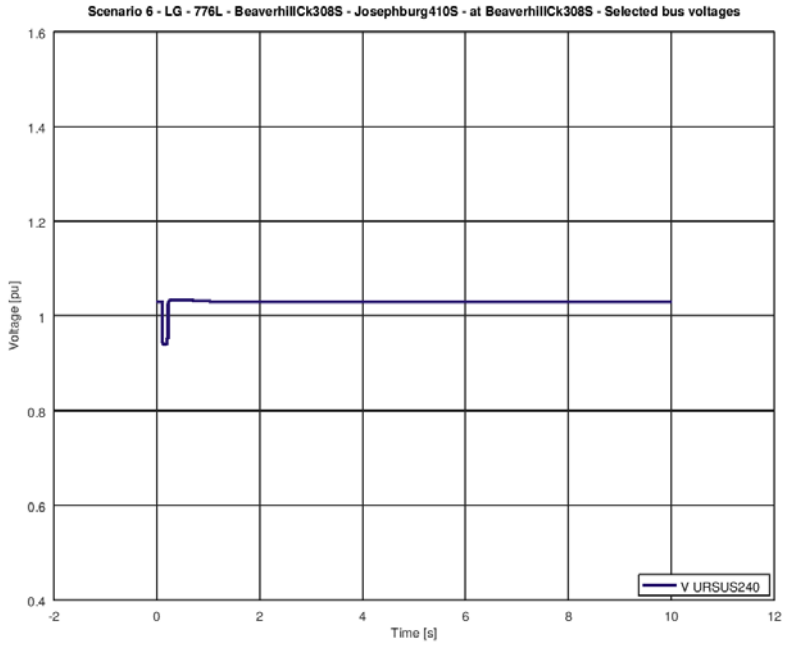


Figure A-350 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

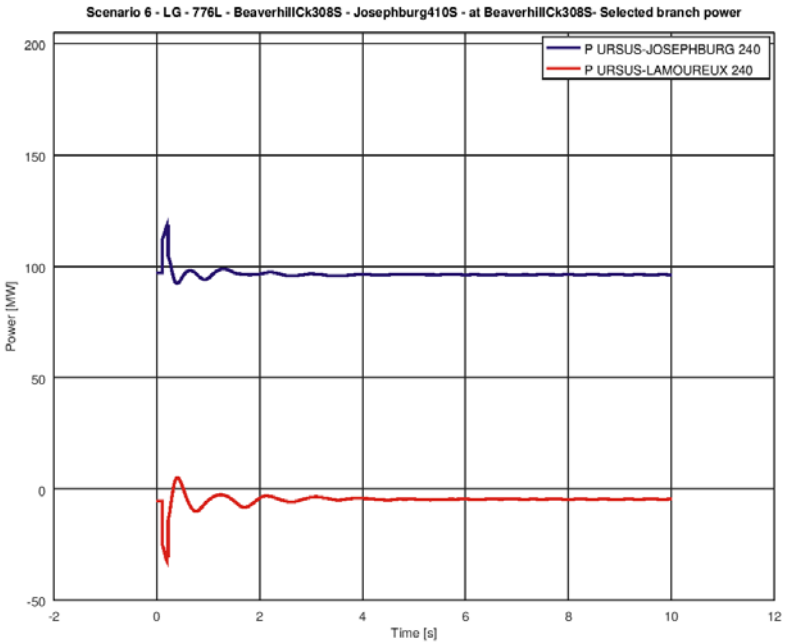


Figure A-351 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

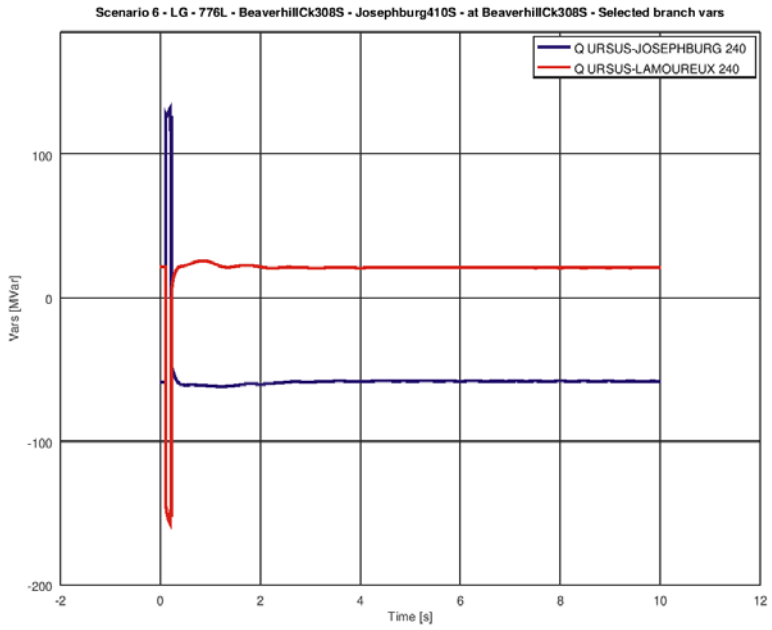


Figure A-352 Scenario 6 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

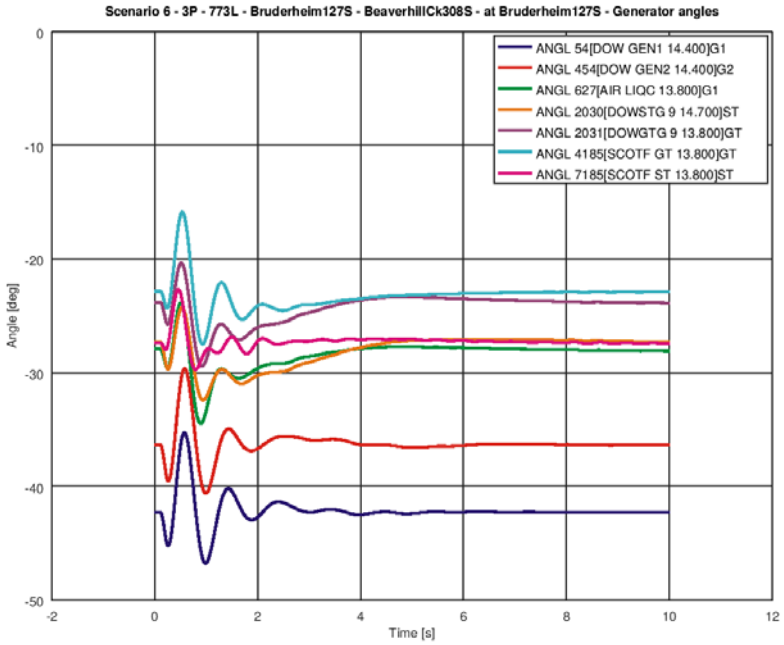


Figure A-353 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

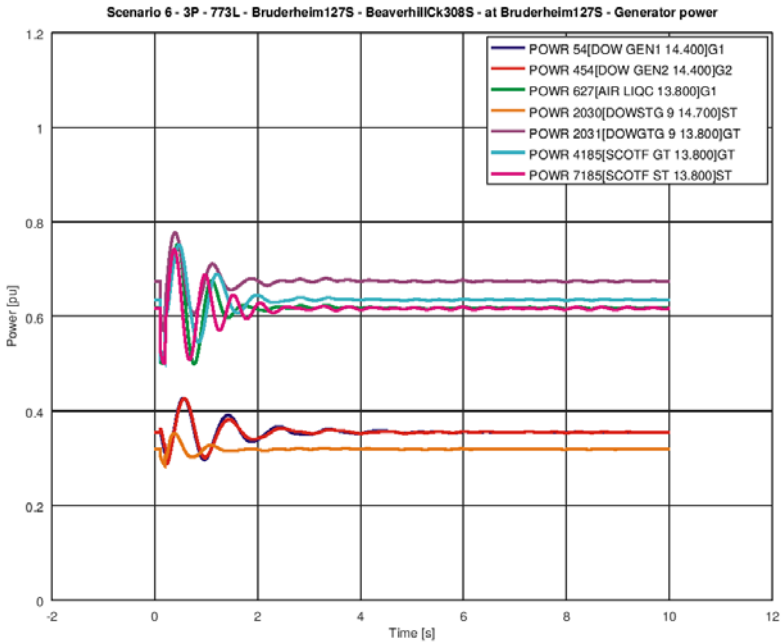


Figure A-354 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

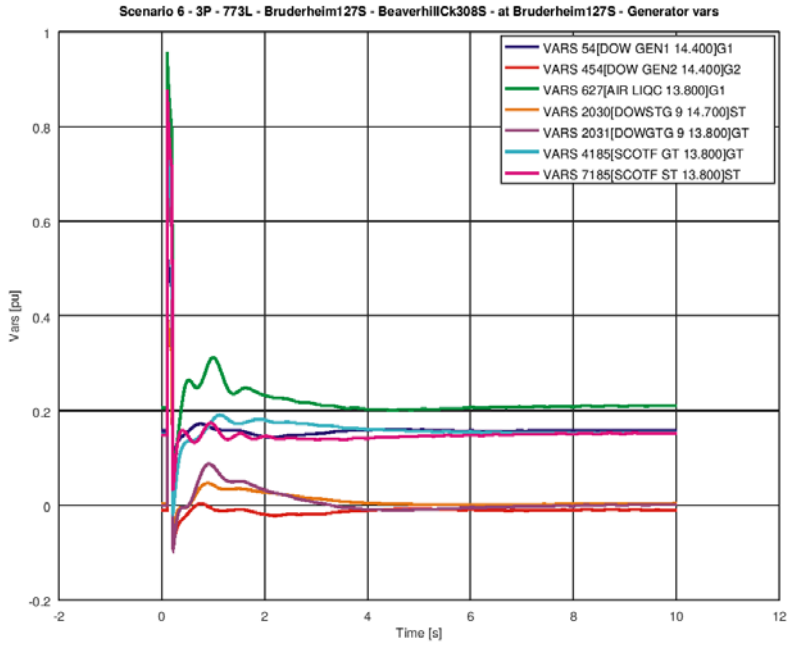


Figure A-355 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

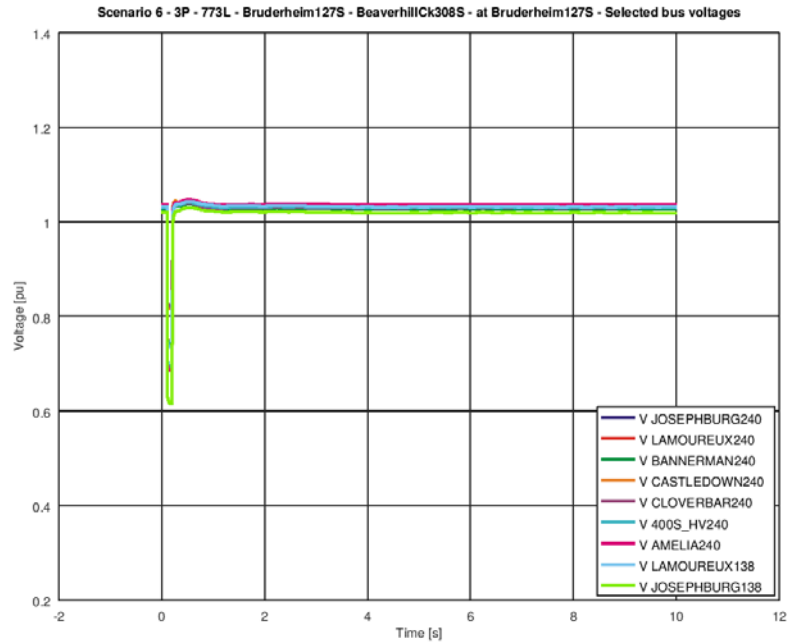


Figure A-356 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

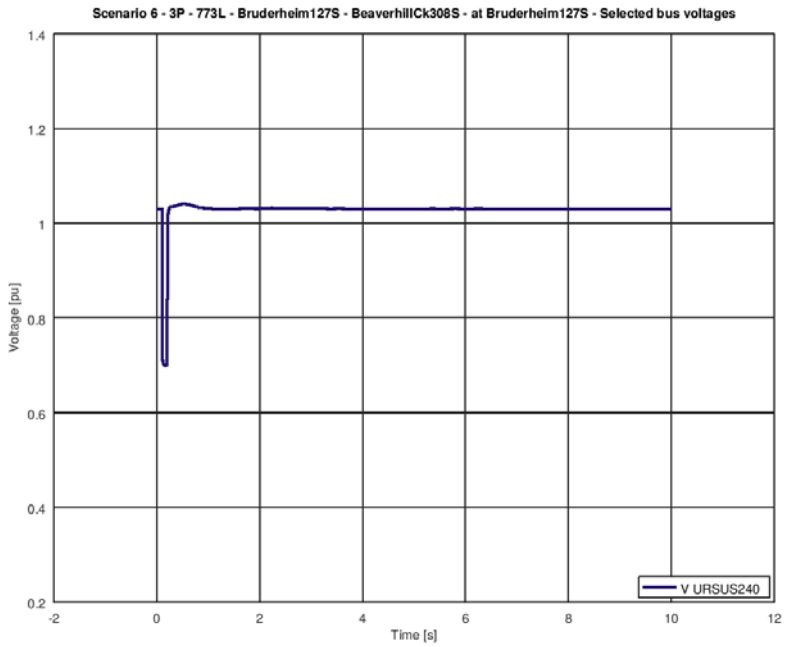


Figure A-357 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

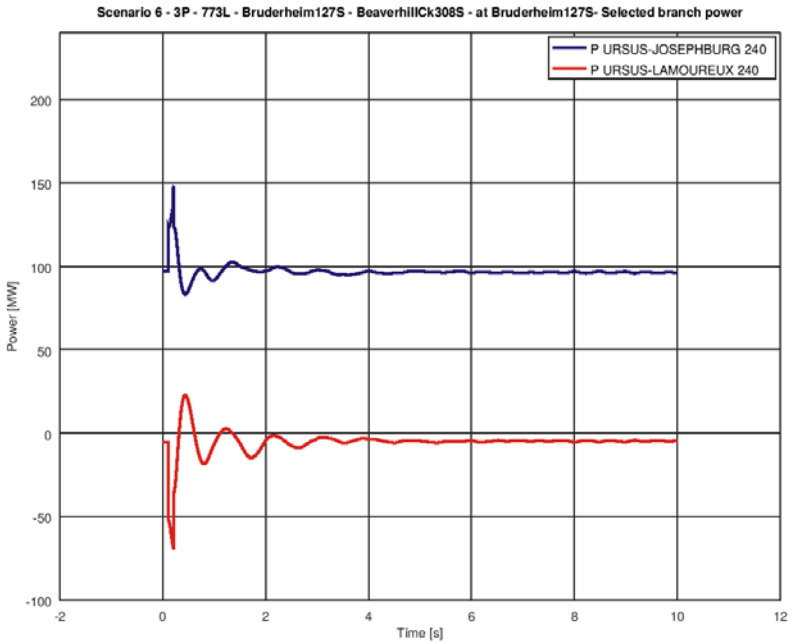


Figure A-358 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

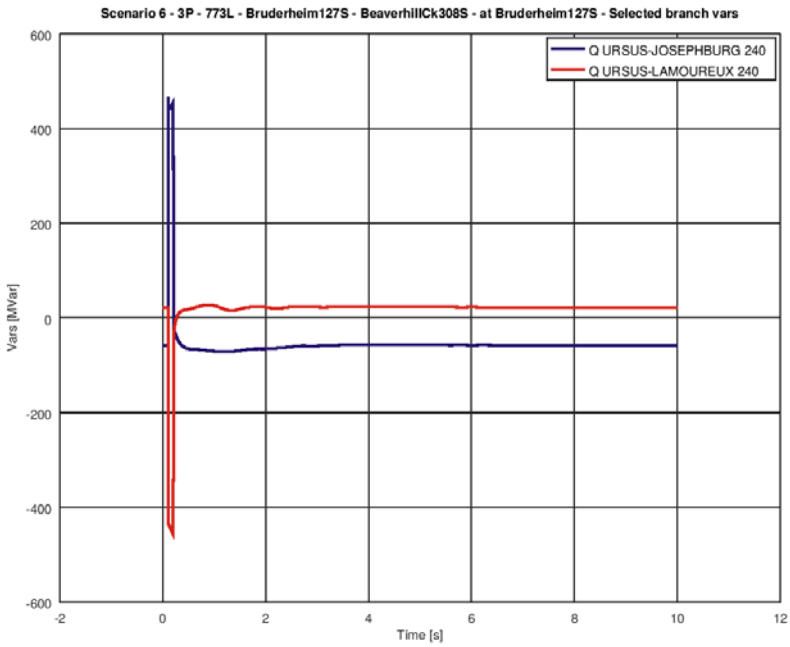


Figure A-359 Scenario 6 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

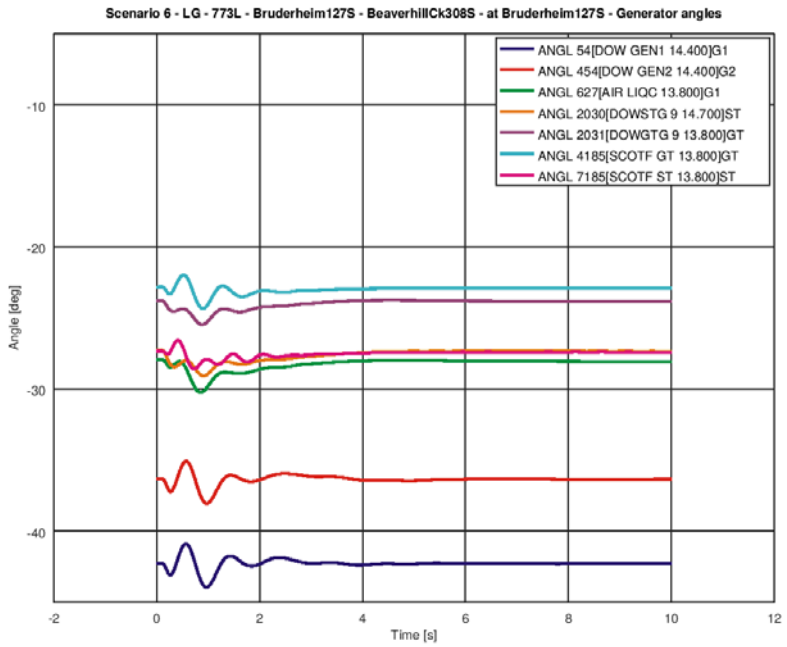


Figure A-360 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

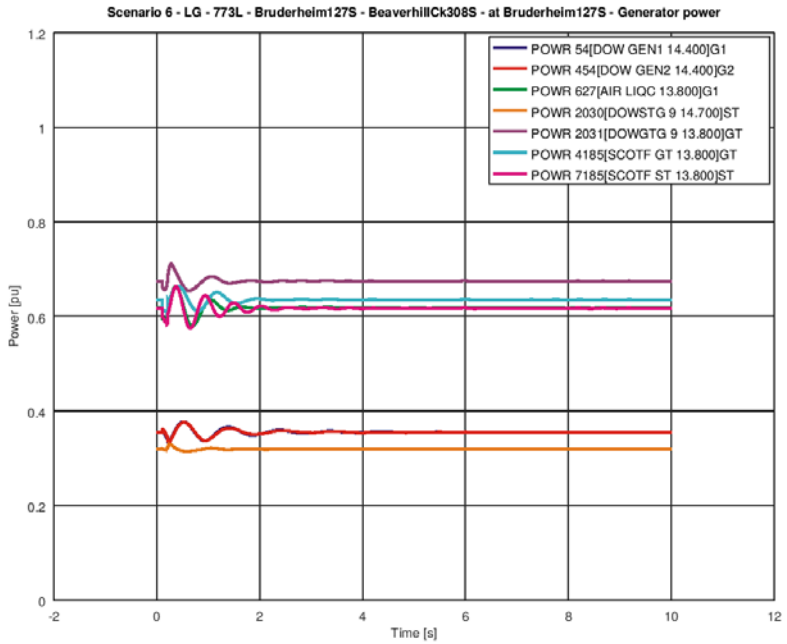


Figure A-361 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

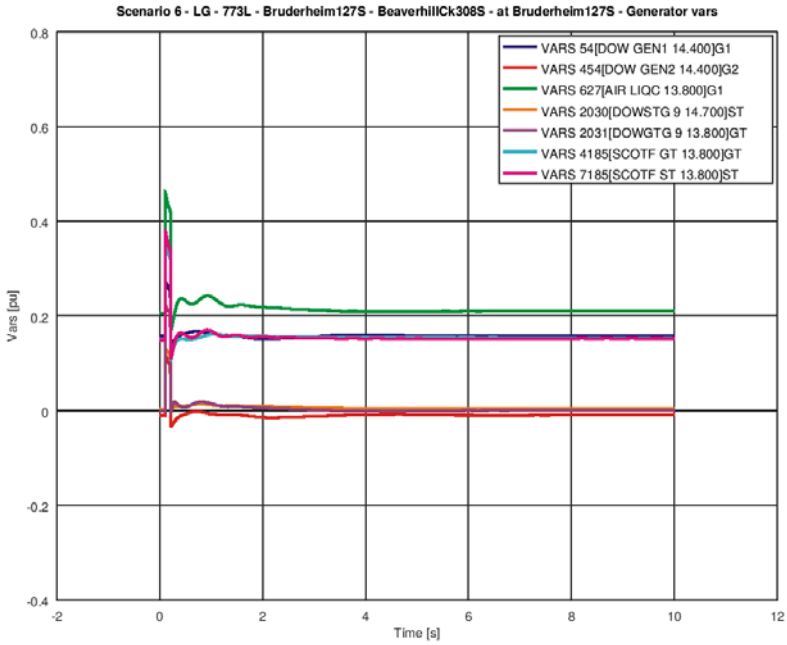


Figure A-362 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

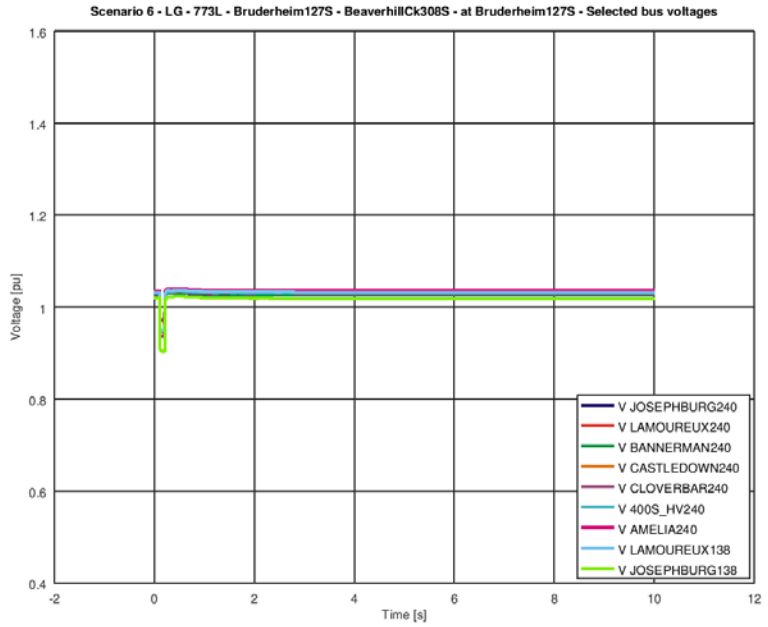


Figure A-363 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

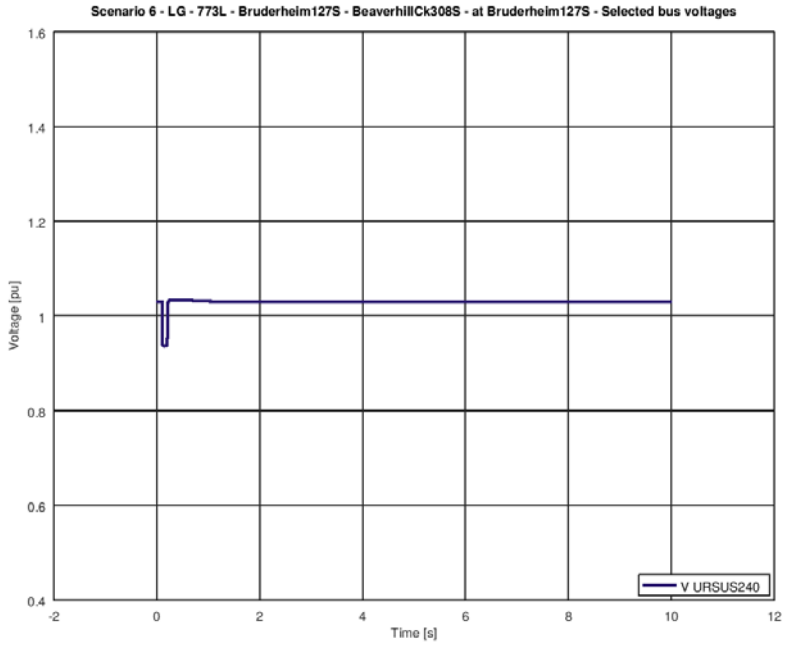


Figure A-364 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

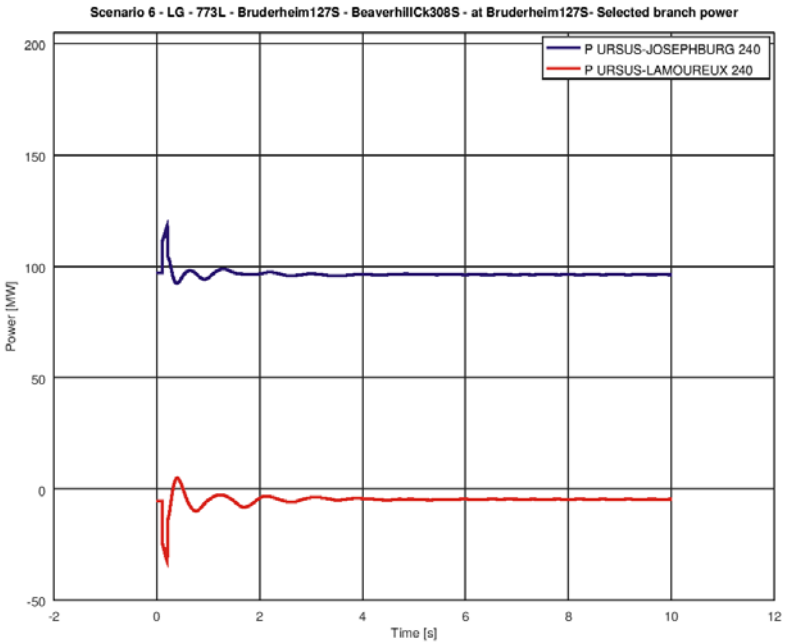


Figure A-365 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

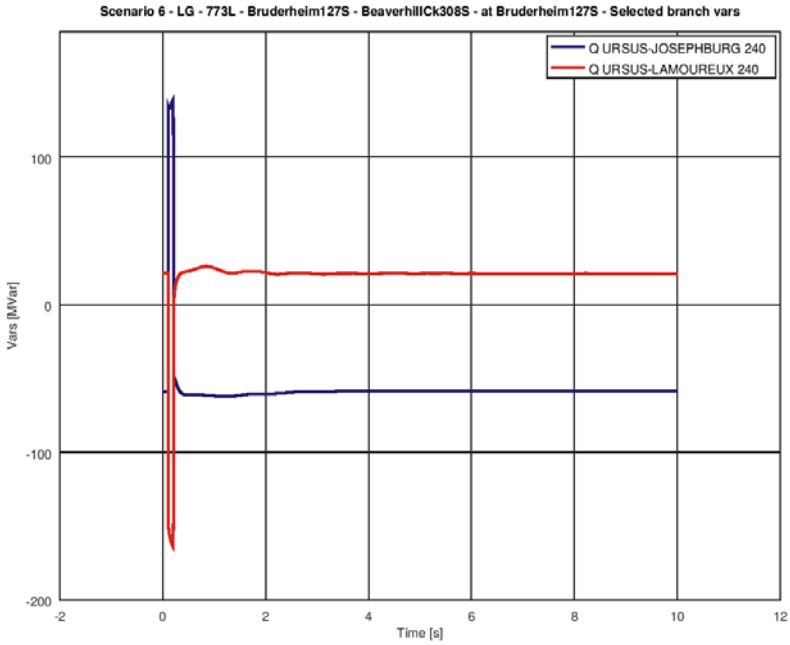


Figure A-366 Scenario 6 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

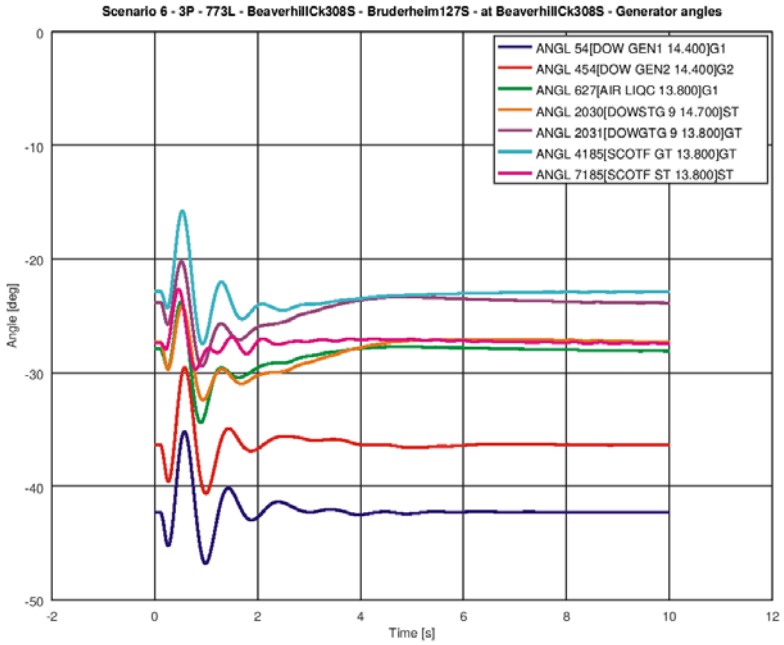


Figure A-367 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

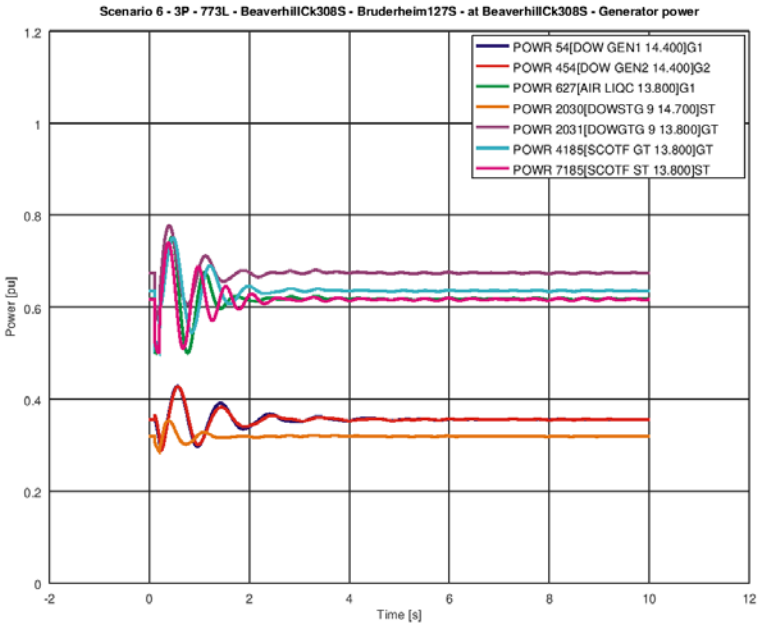


Figure A-368 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

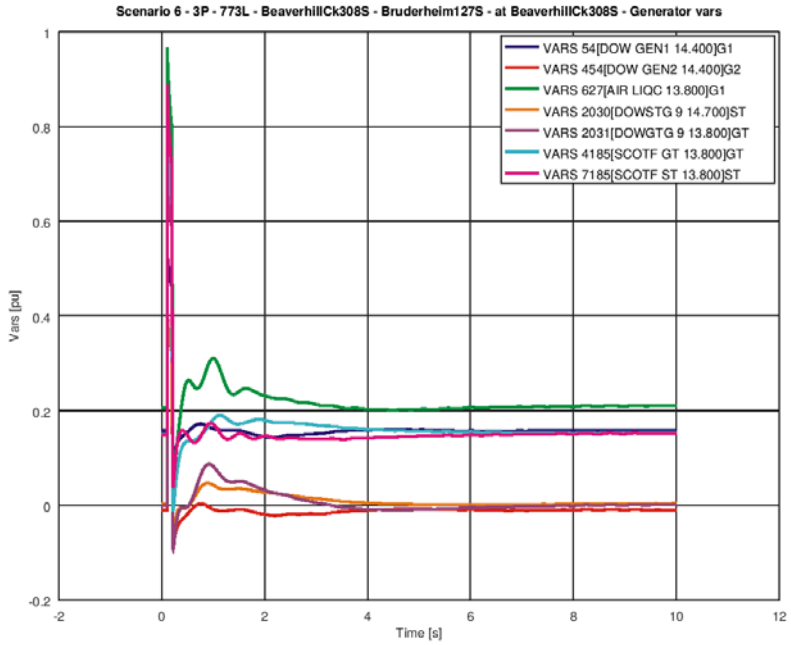


Figure A-369 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

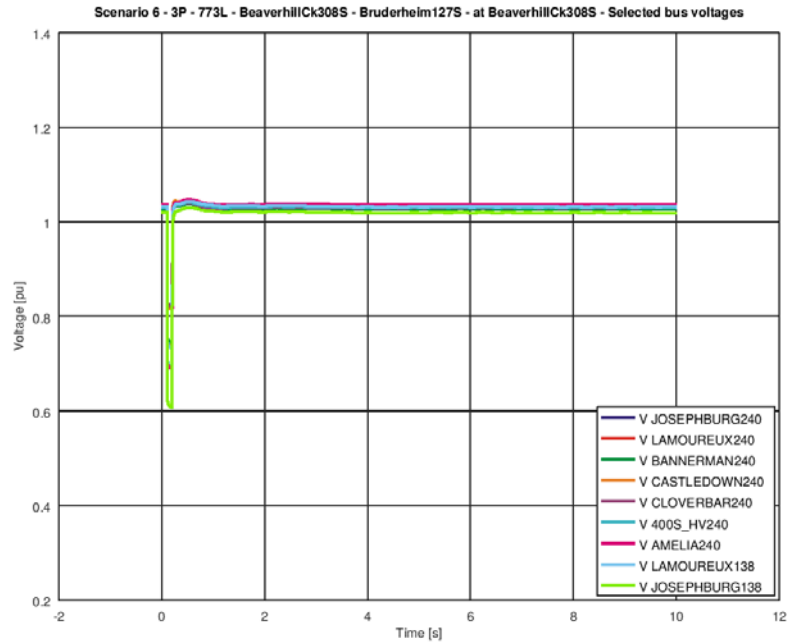


Figure A-370 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

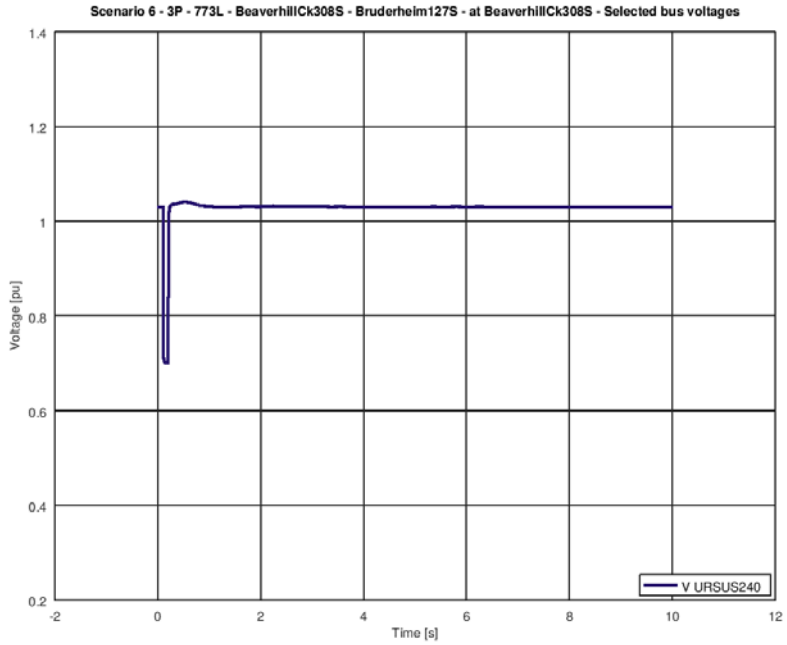


Figure A-371 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

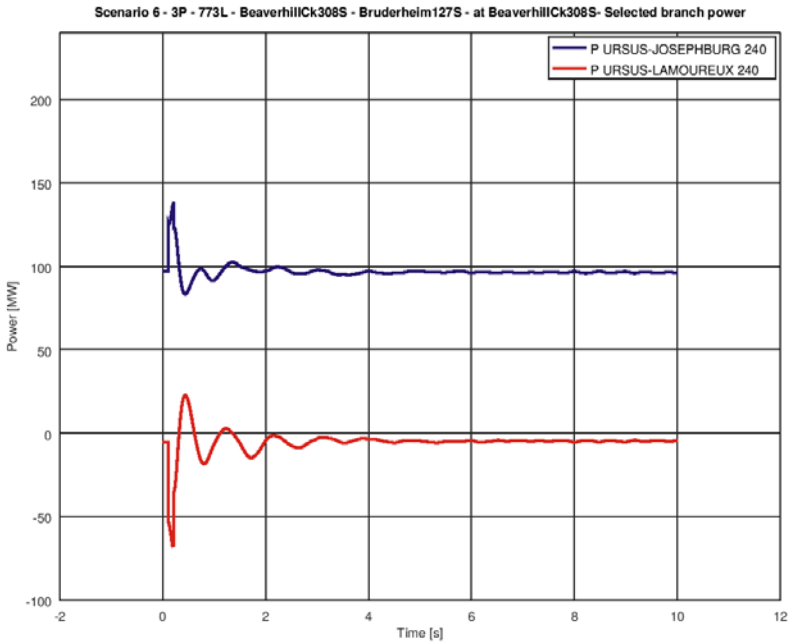


Figure A-372 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

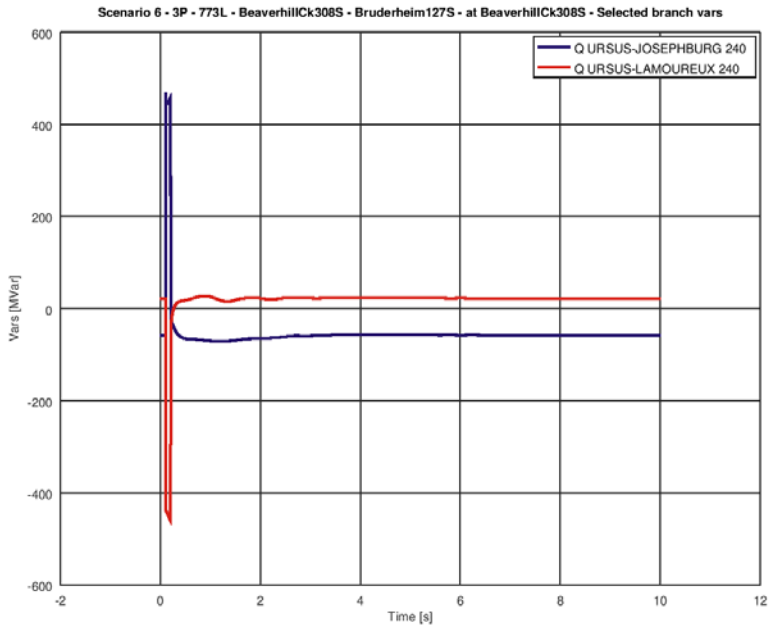


Figure A-373 Scenario 6 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

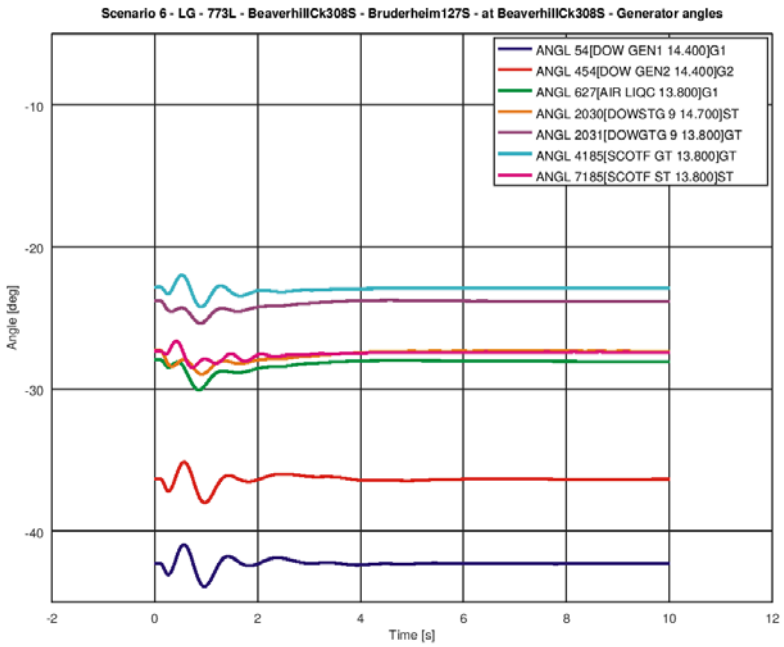


Figure A-374 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

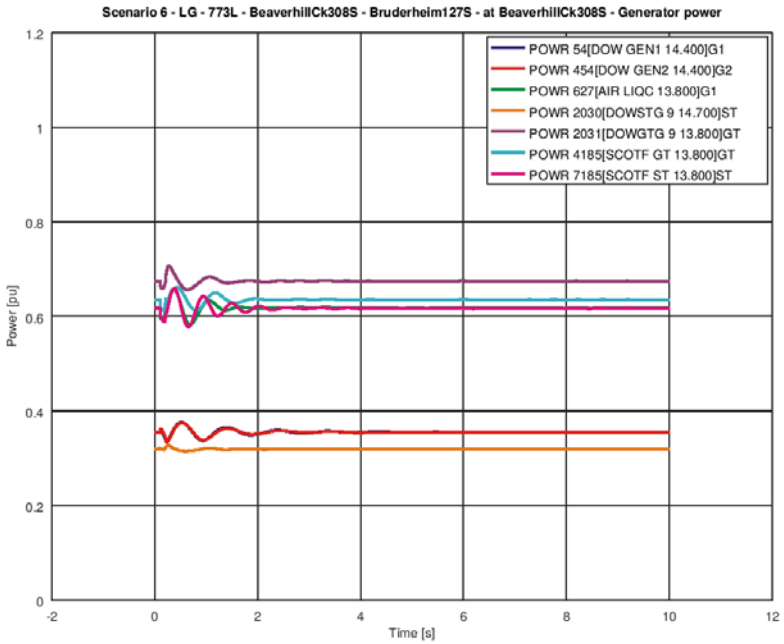


Figure A-375 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

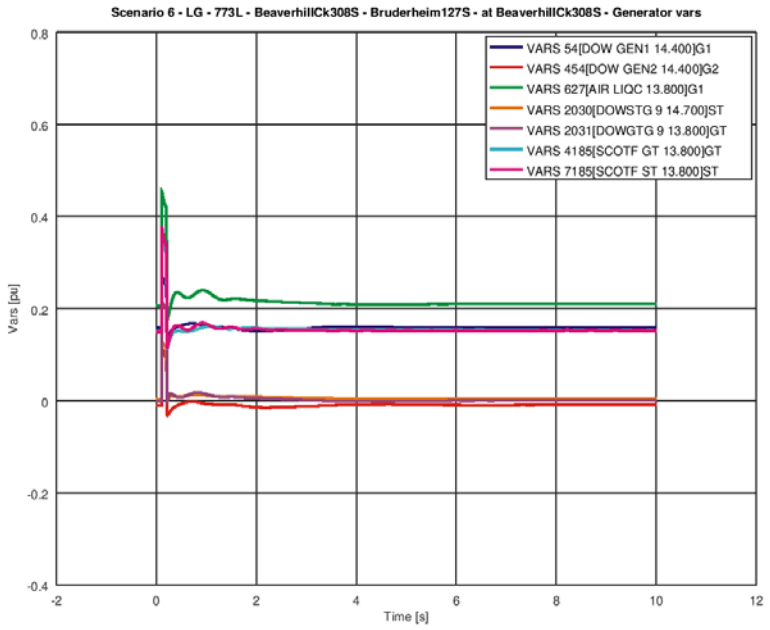


Figure A-376 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

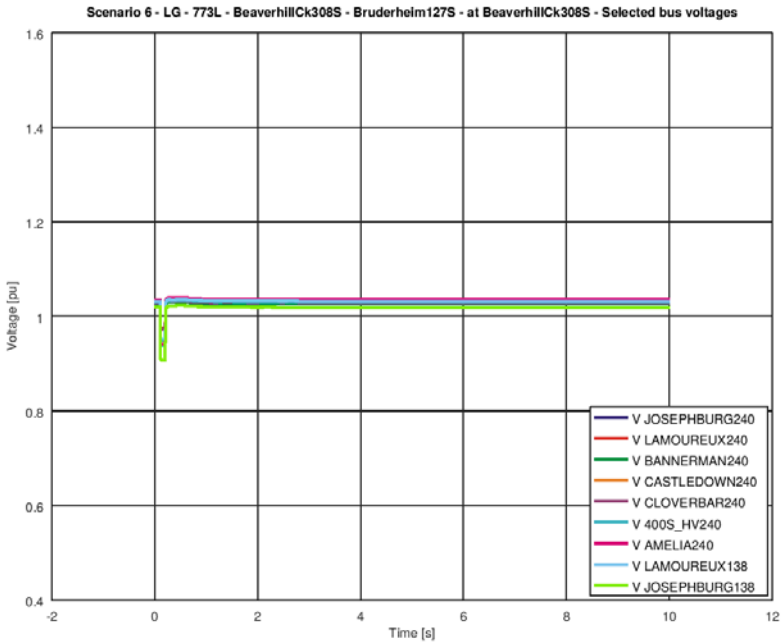


Figure A-377 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

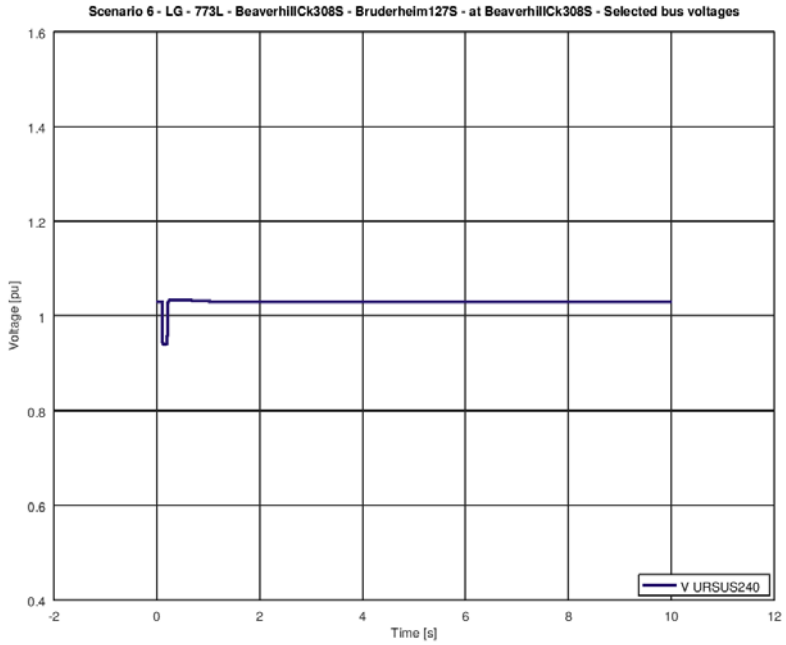


Figure A-378 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

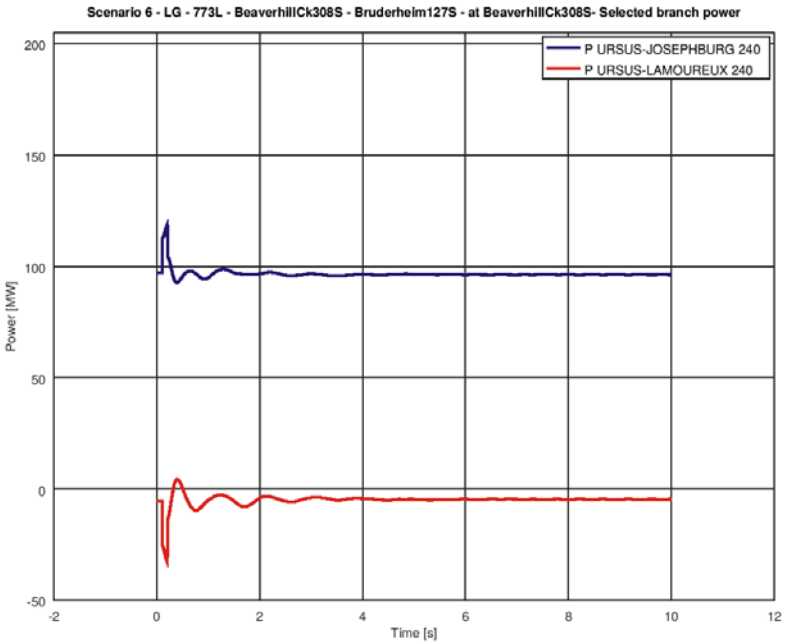


Figure A-379 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

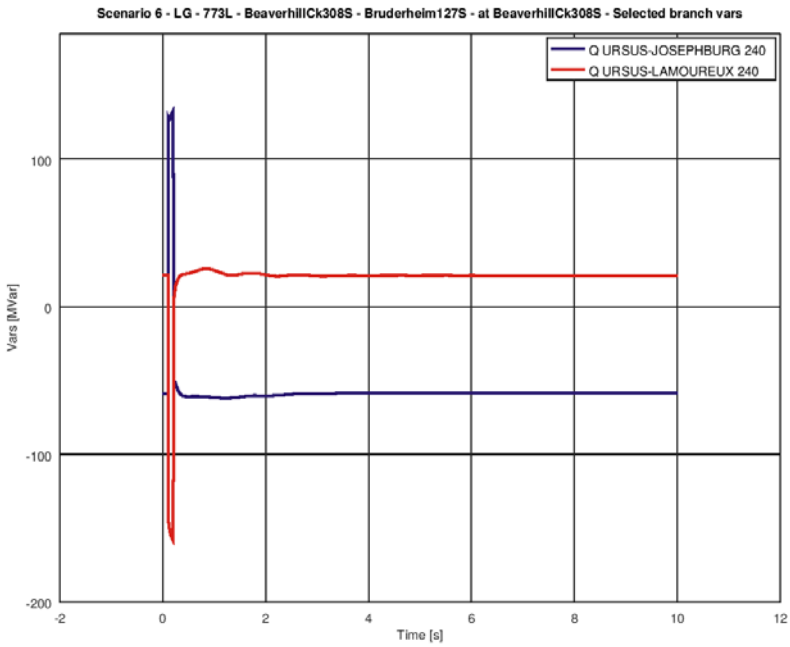


Figure A-380 Scenario 6 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

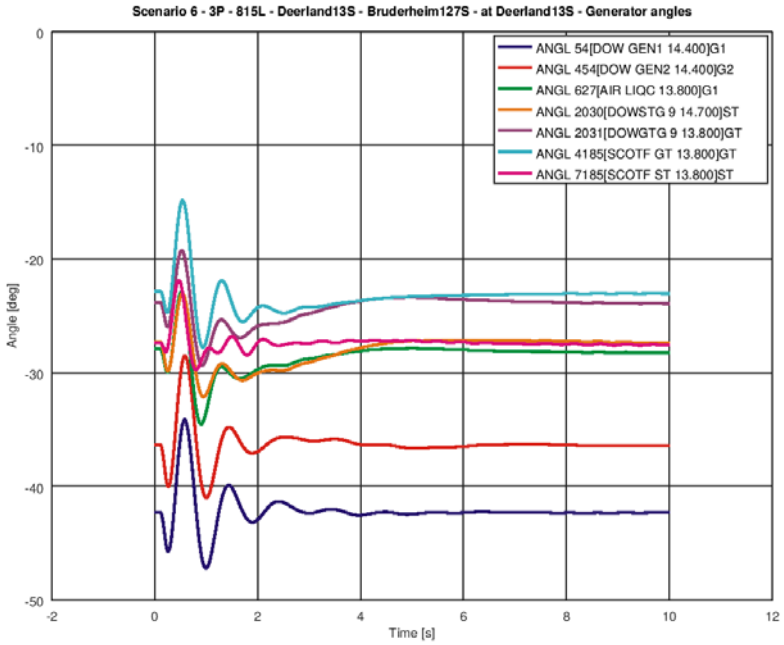


Figure A-381 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

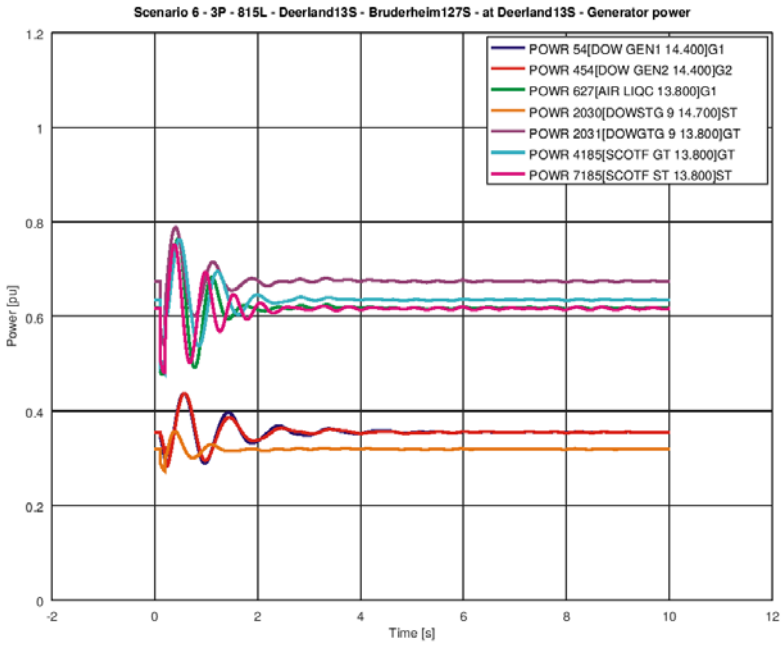


Figure A-382 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

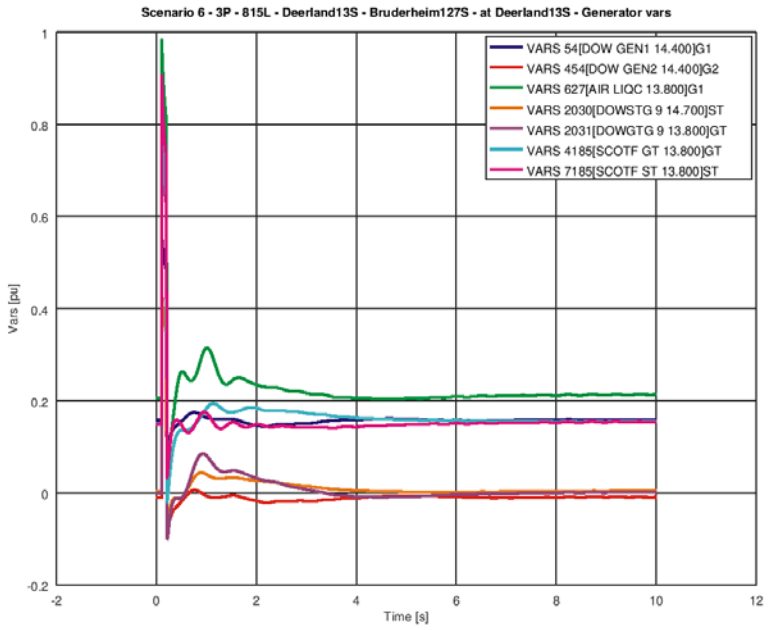


Figure A-383 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

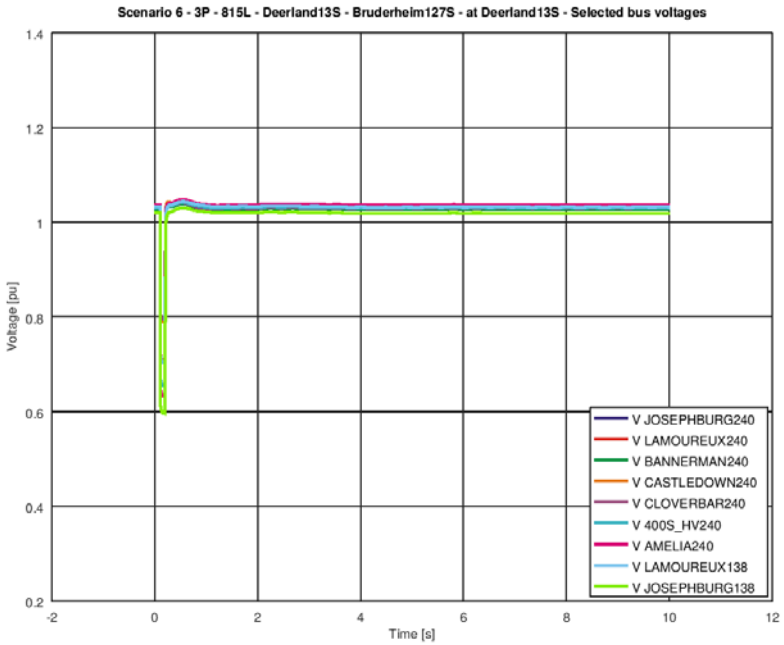


Figure A-384 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

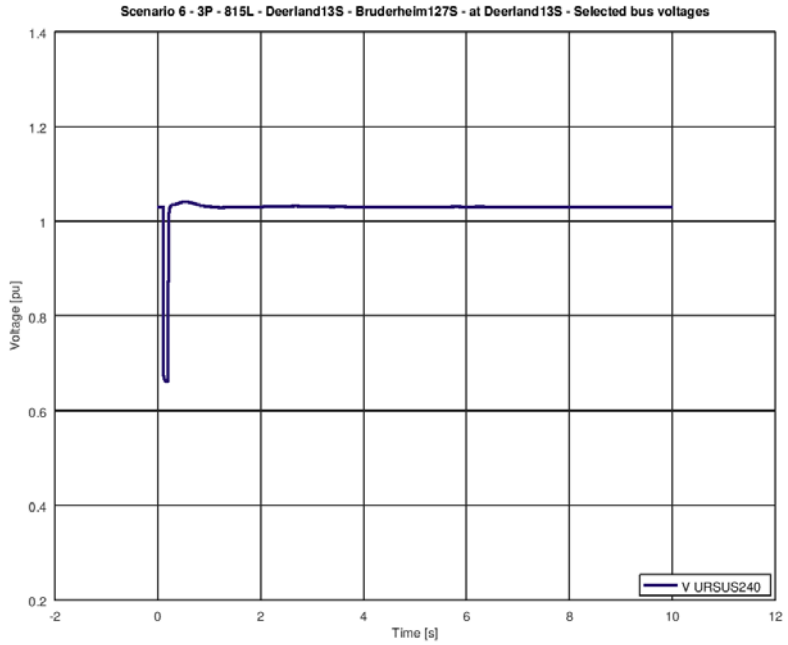


Figure A-385 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

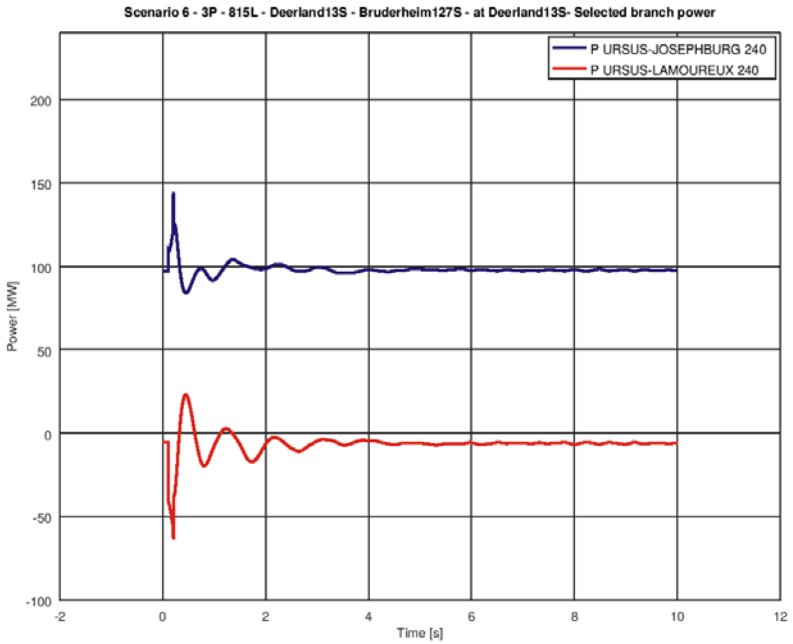


Figure A-386 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

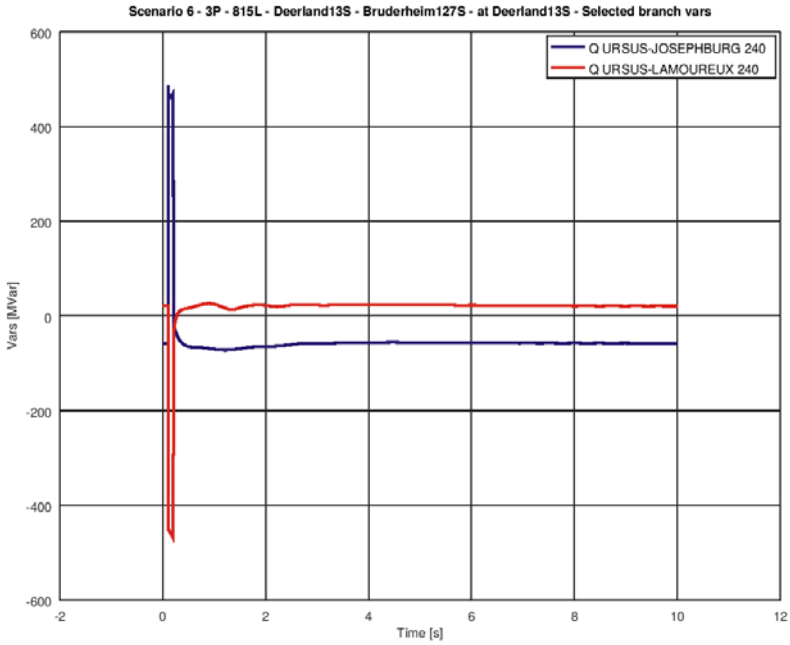


Figure A-387 Scenario 6 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

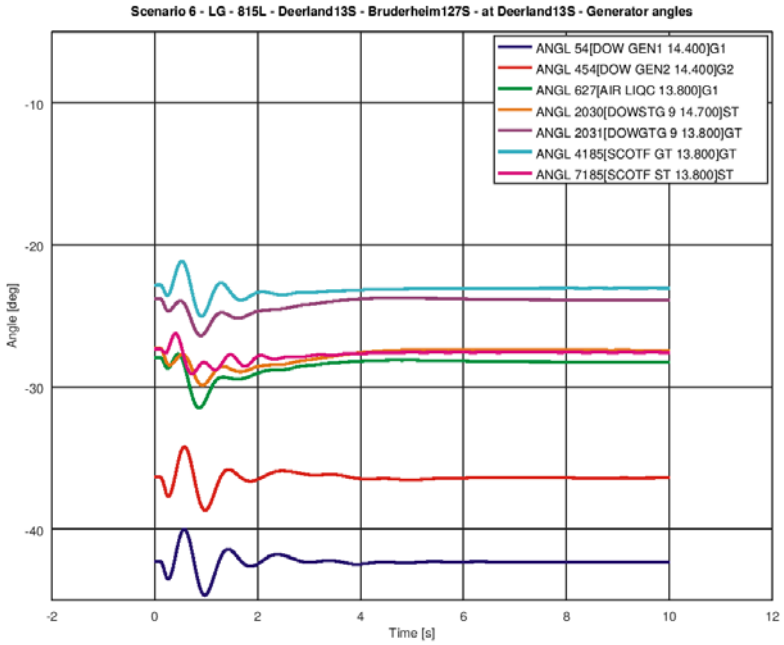


Figure A-388 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

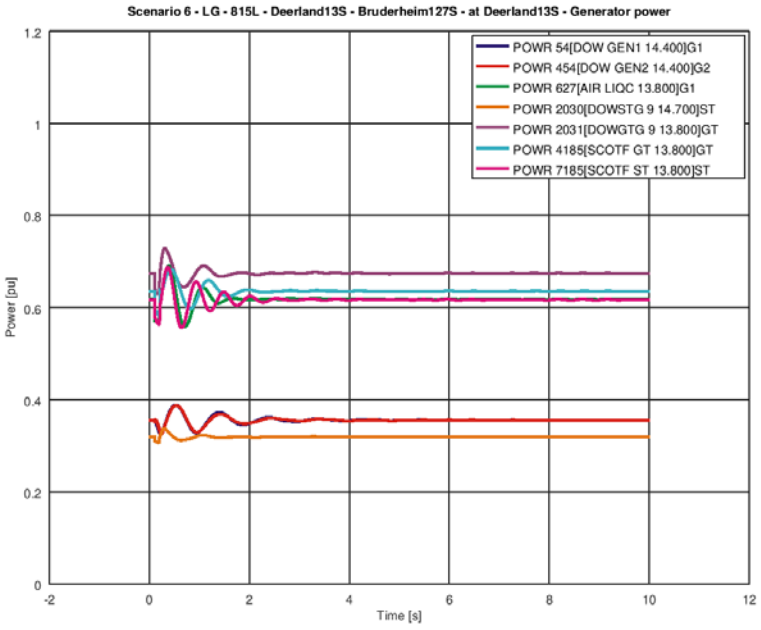


Figure A-389 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

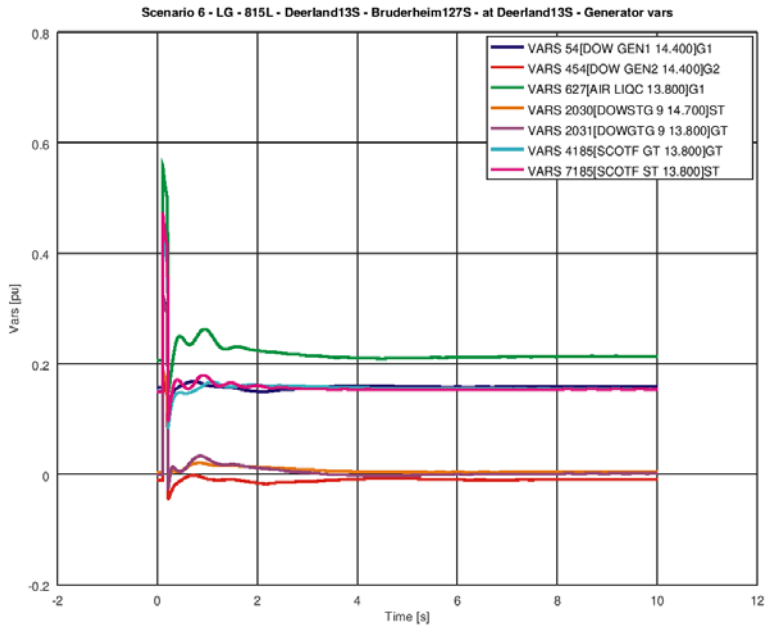


Figure A-390 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

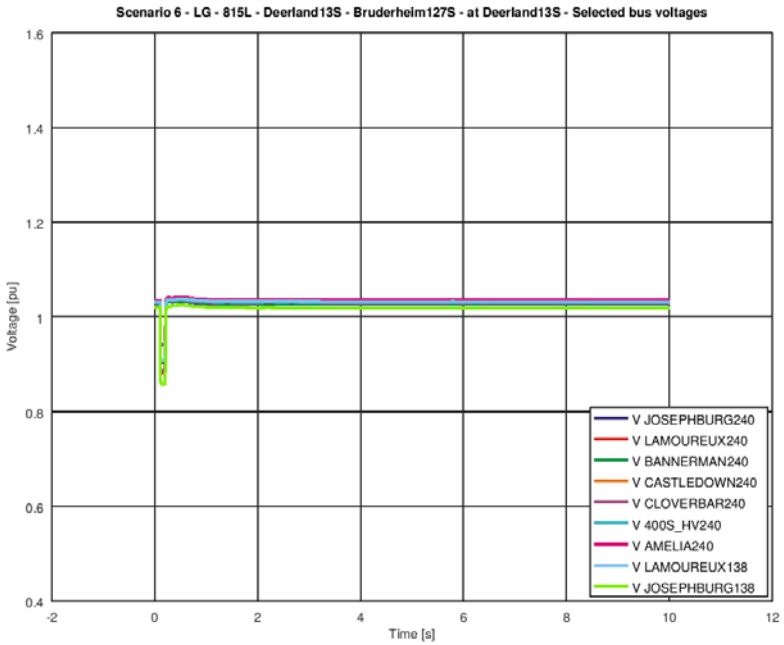


Figure A-391 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

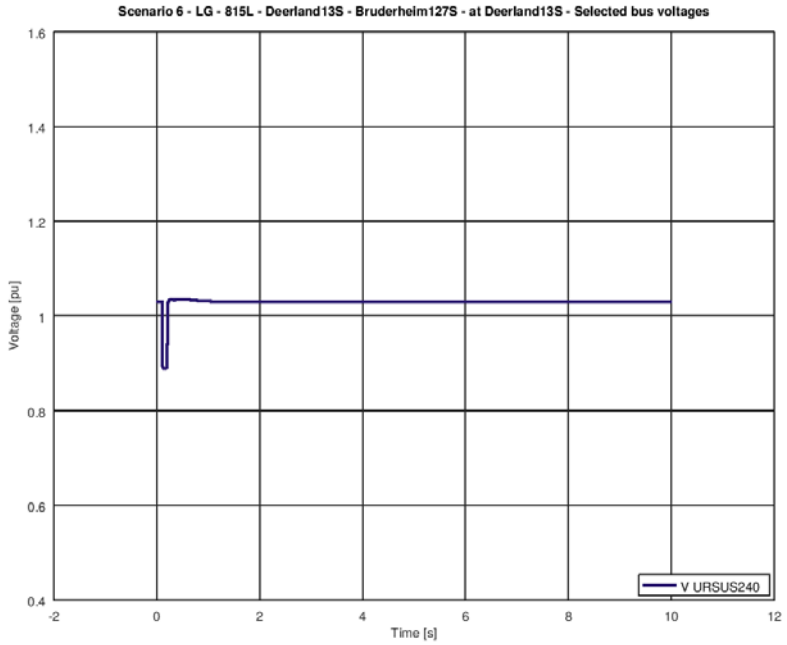


Figure A-392 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

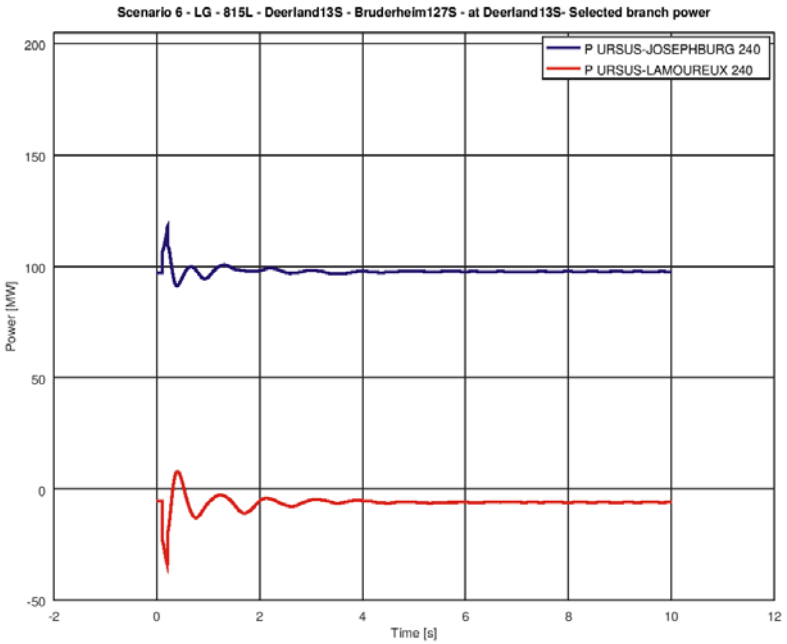


Figure A-393 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

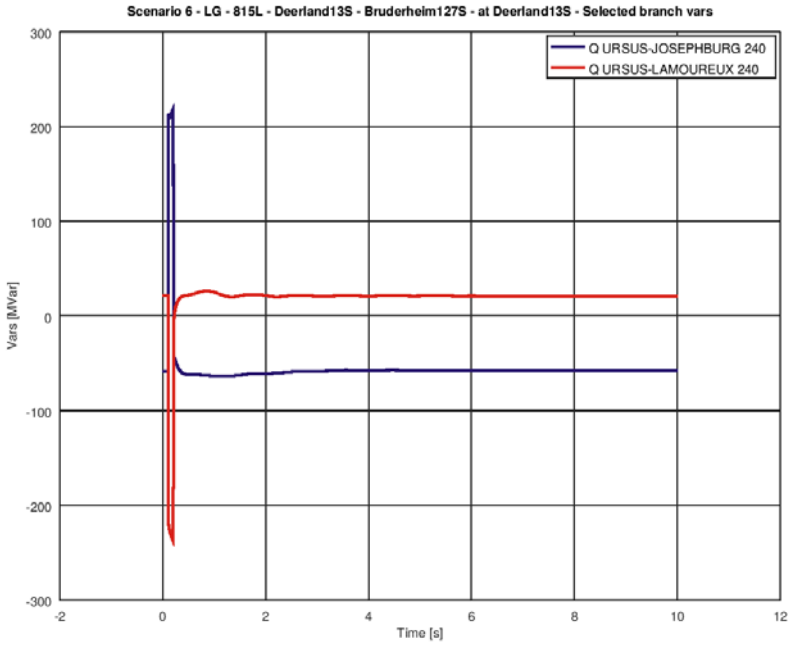


Figure A-394 Scenario 6 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

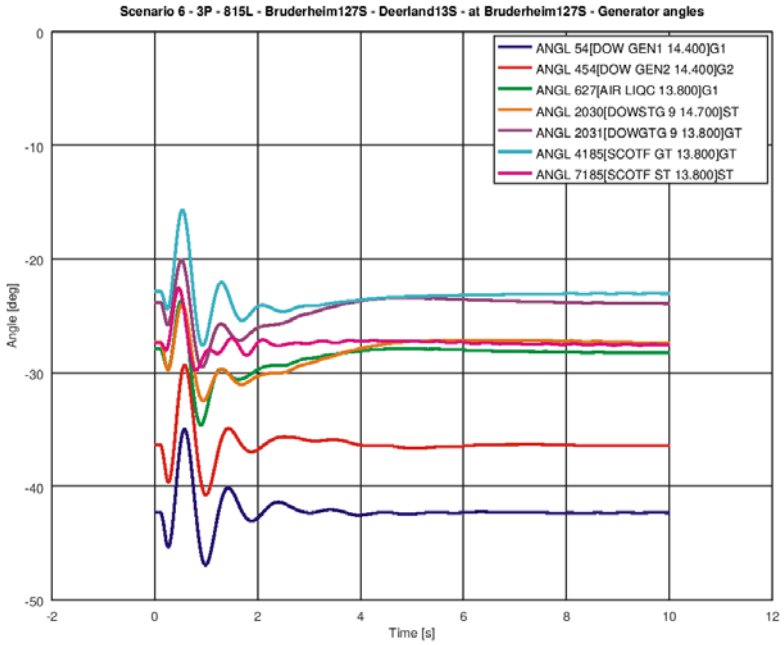


Figure A-395 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

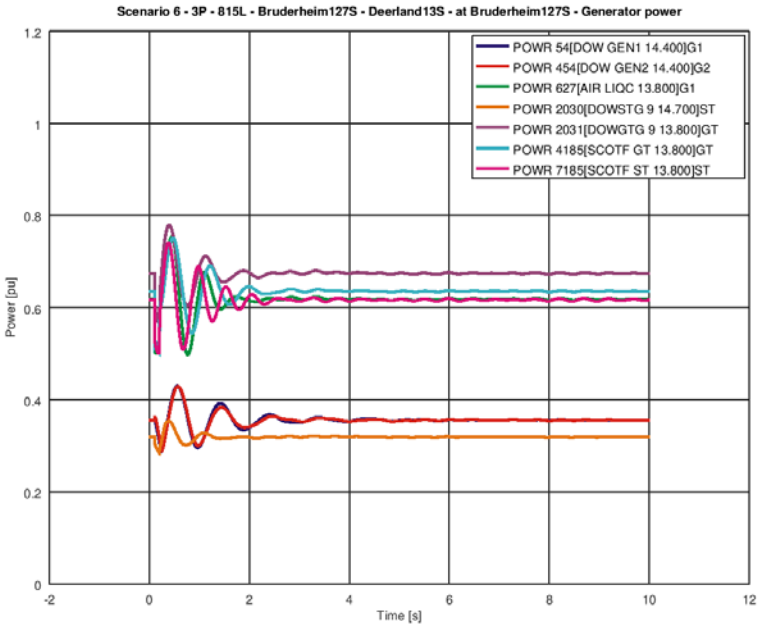


Figure A-396 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

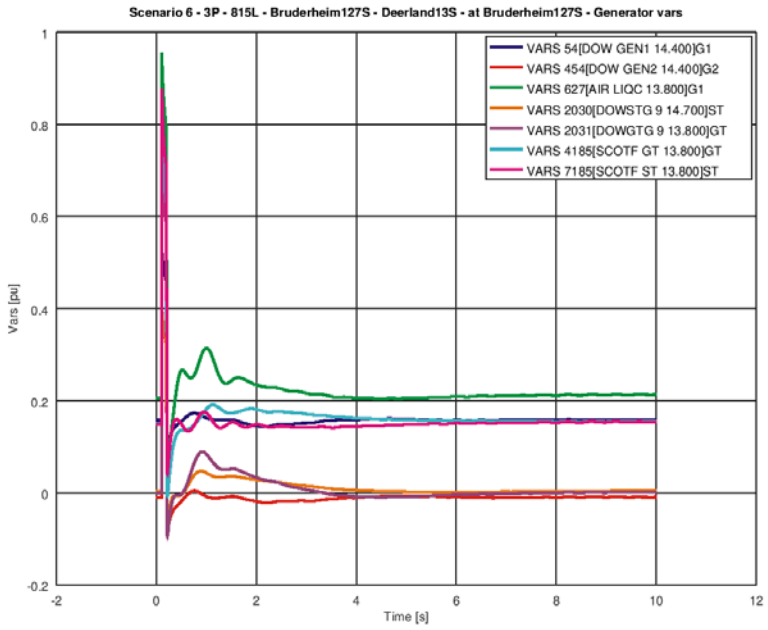


Figure A-397 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

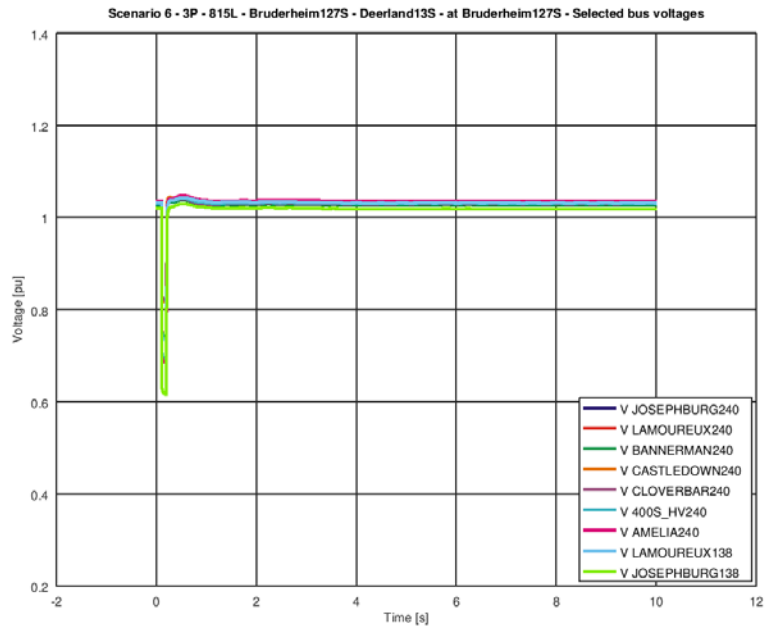


Figure A-398 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

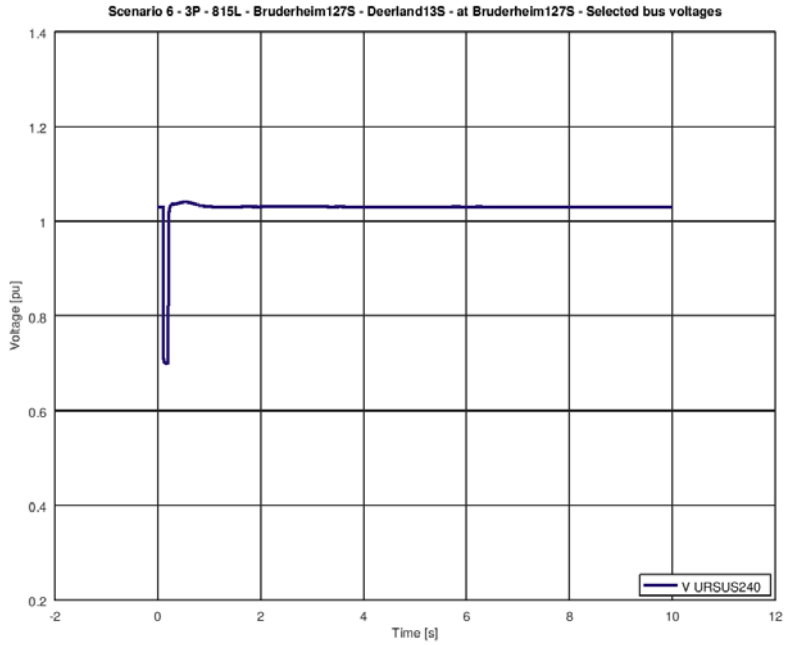


Figure A-399 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

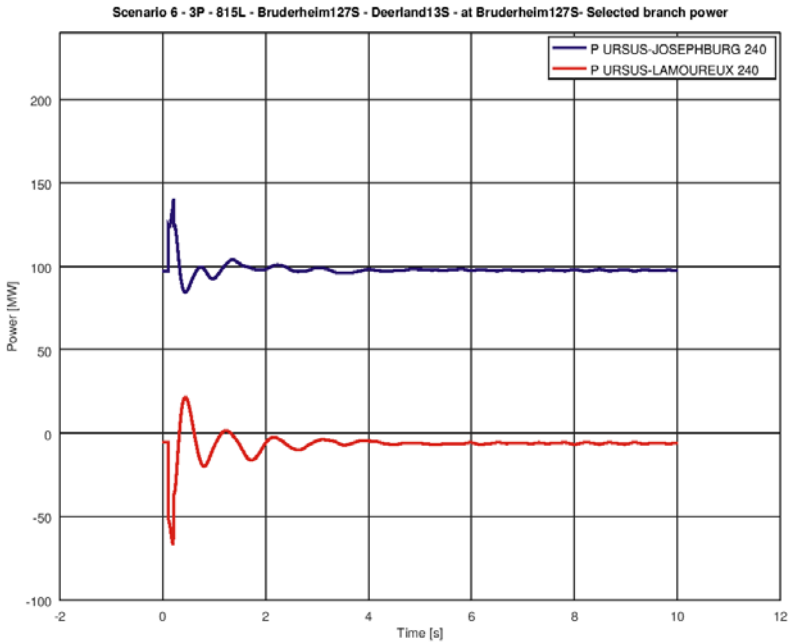


Figure A-400 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

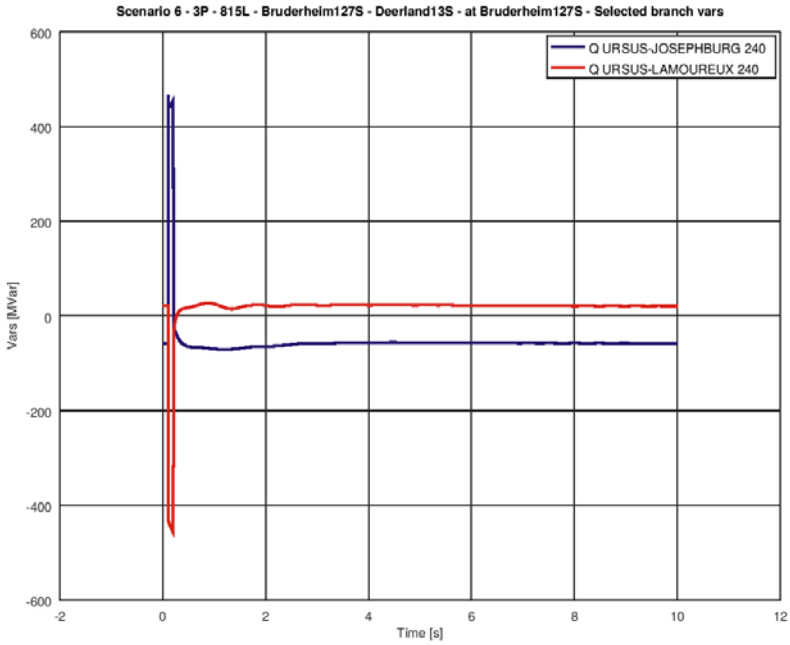


Figure A-401 Scenario 6 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

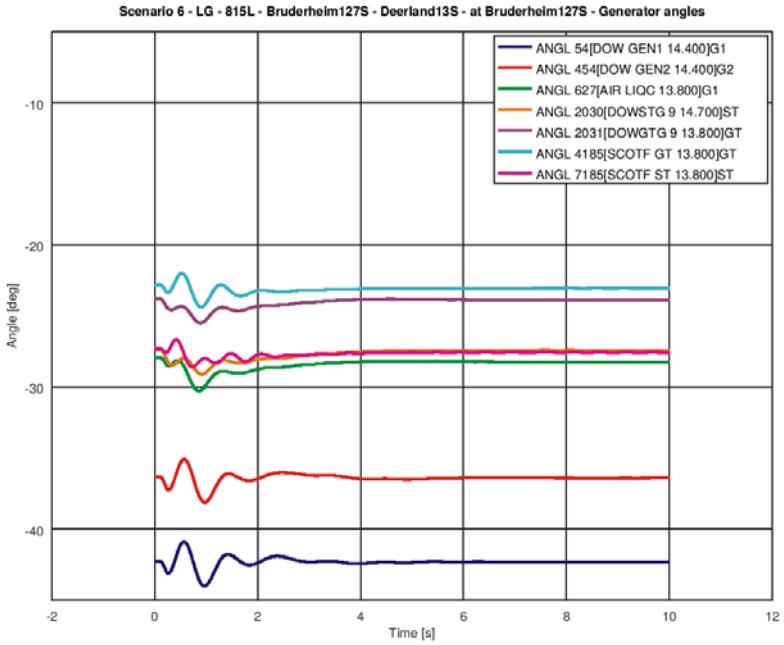


Figure A-402 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

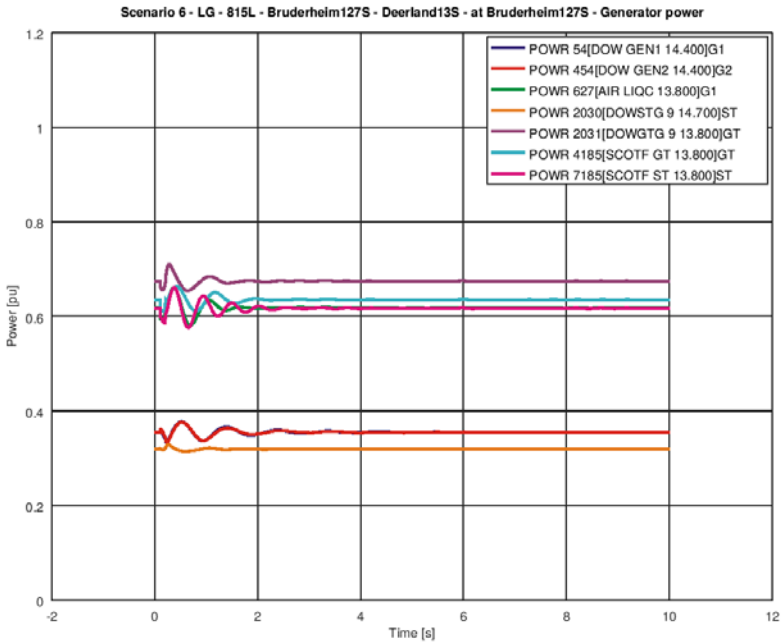


Figure A-403 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

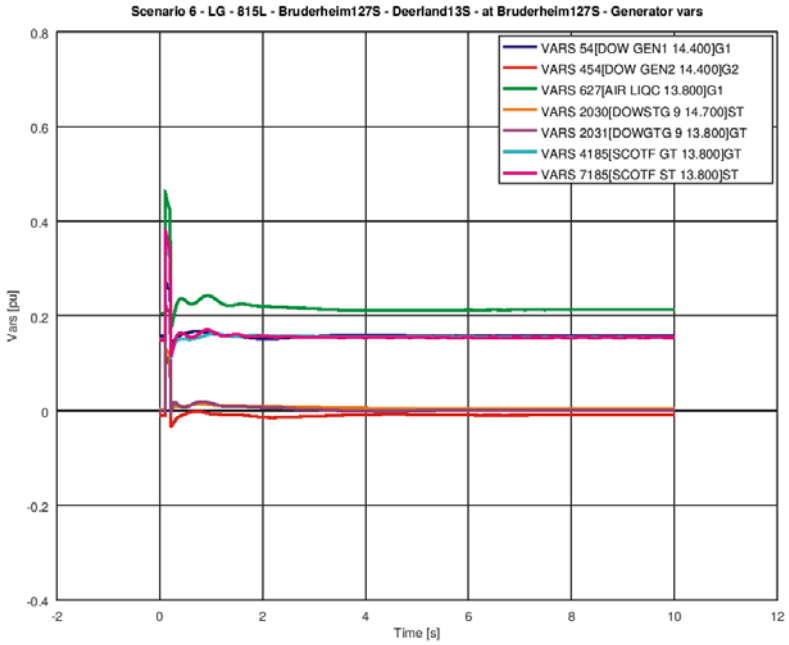


Figure A-404 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

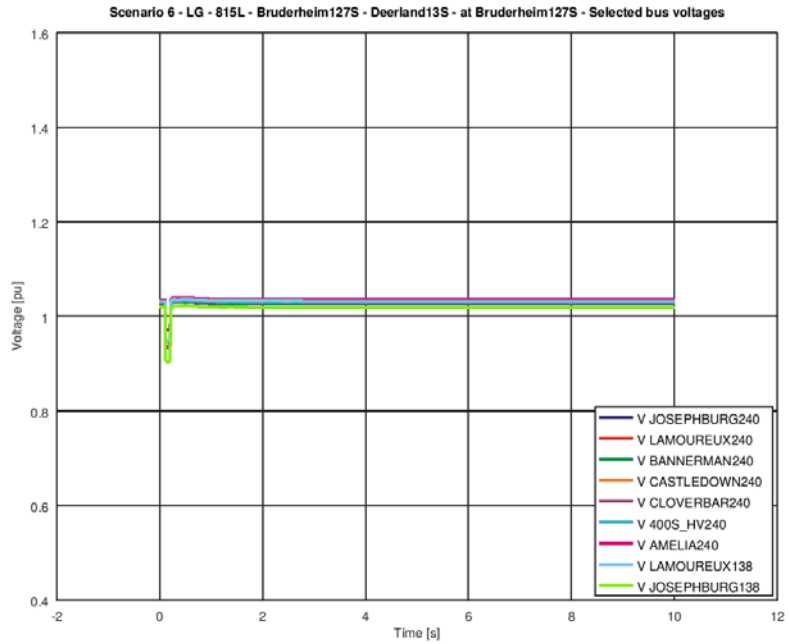


Figure A-405 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

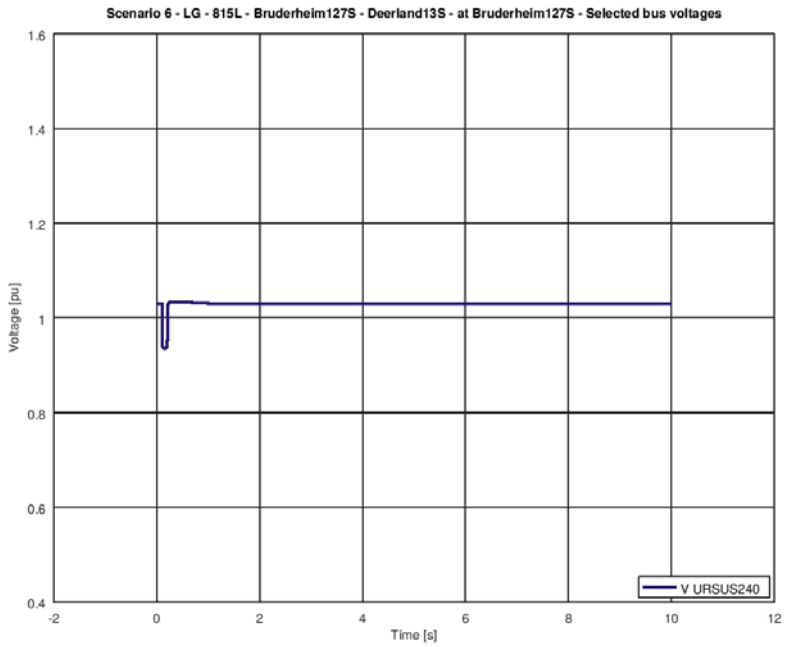


Figure A-406 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

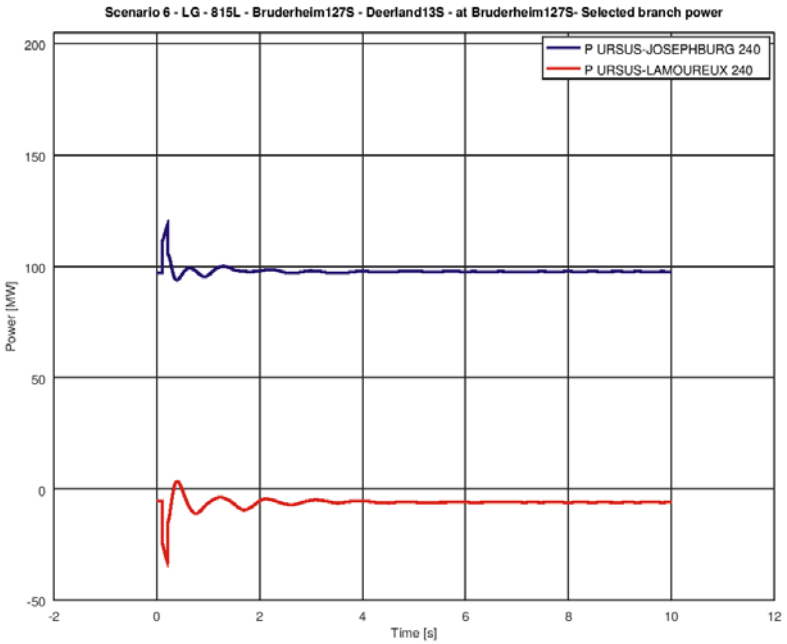


Figure A-407 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

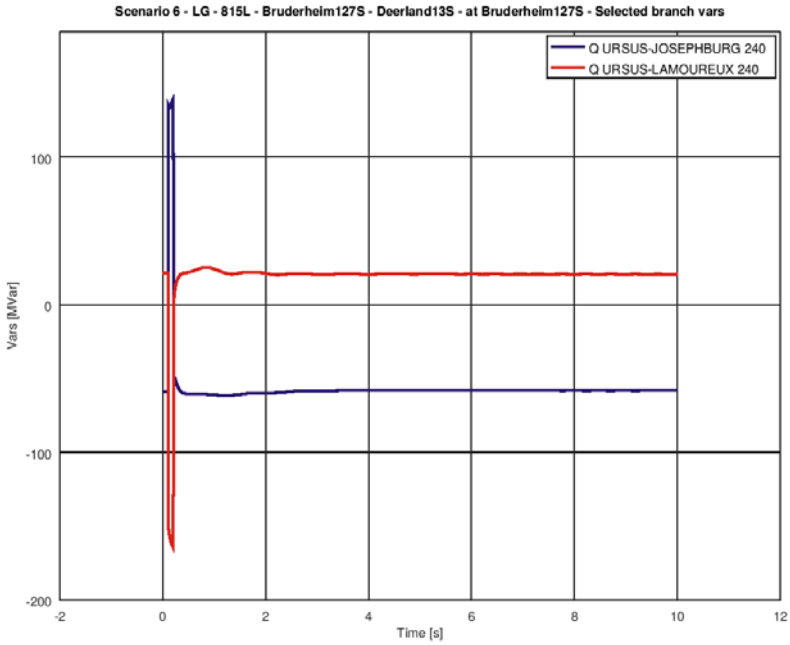


Figure A-408 Scenario 6 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

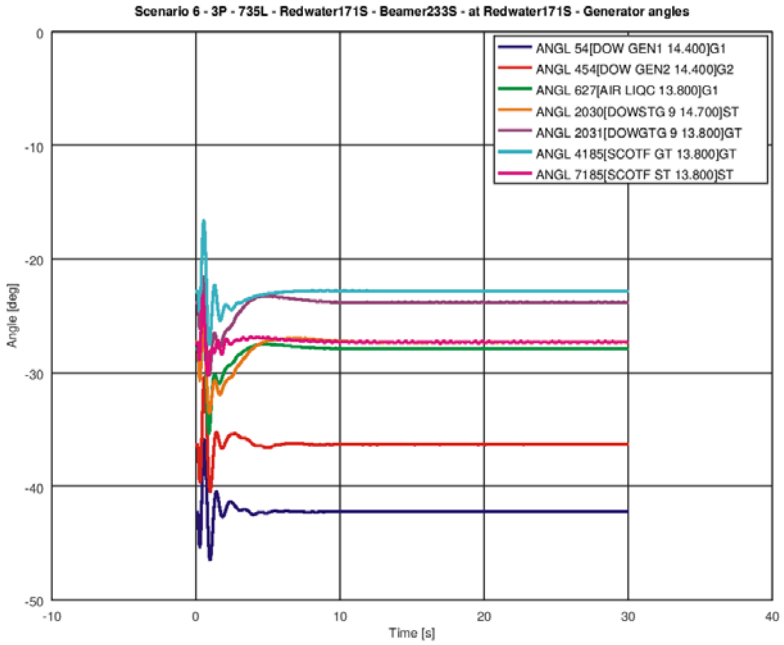


Figure A-409 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

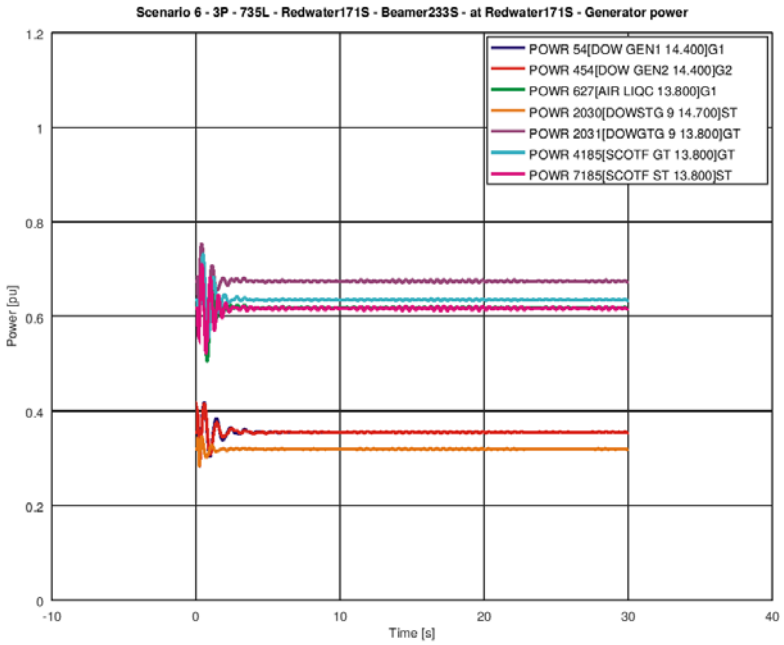


Figure A-410 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

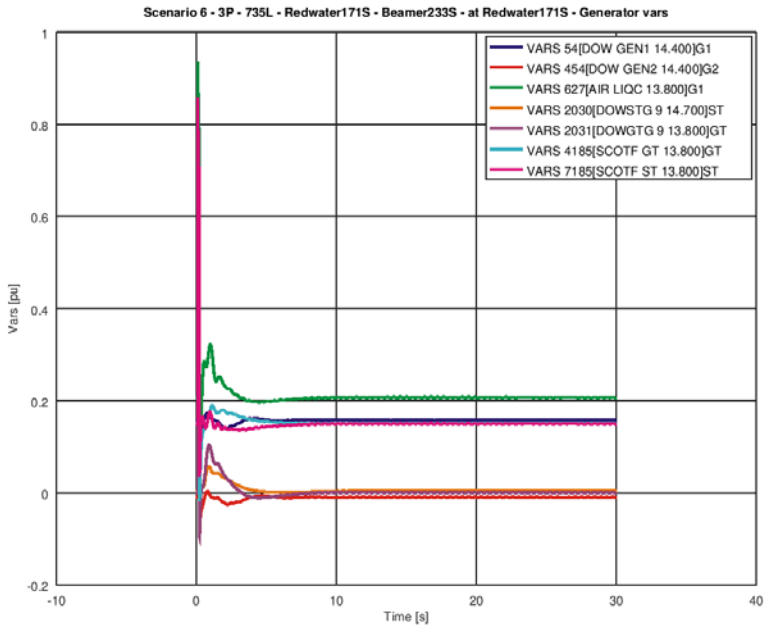


Figure A-411 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

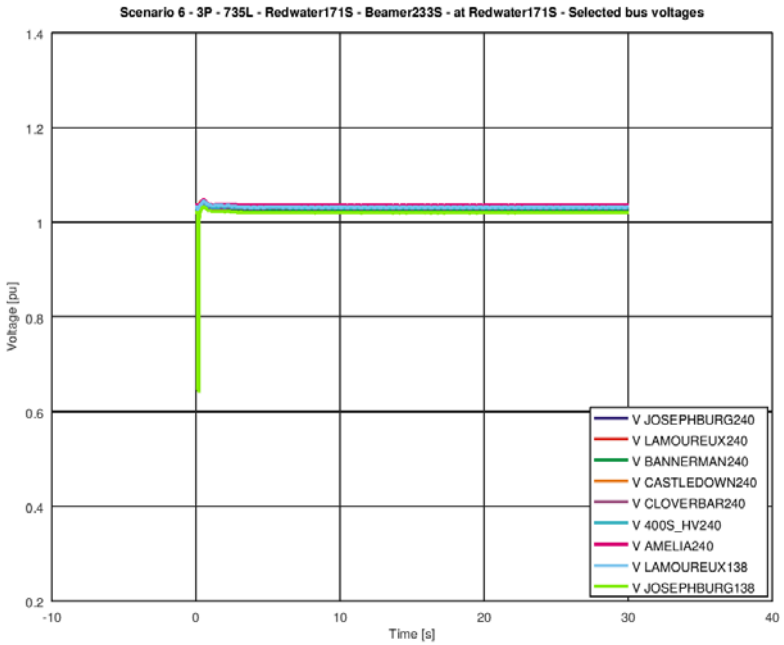


Figure A-412 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

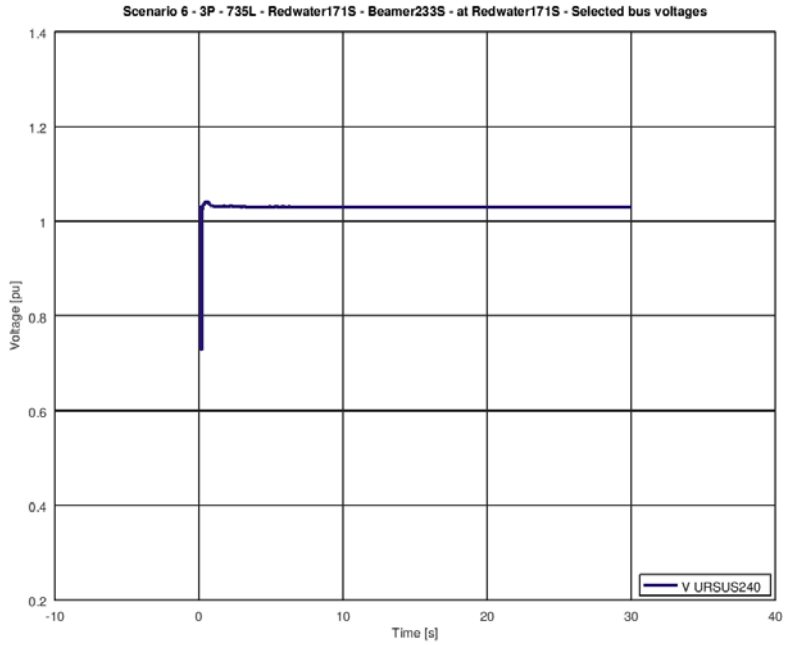


Figure A-413 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

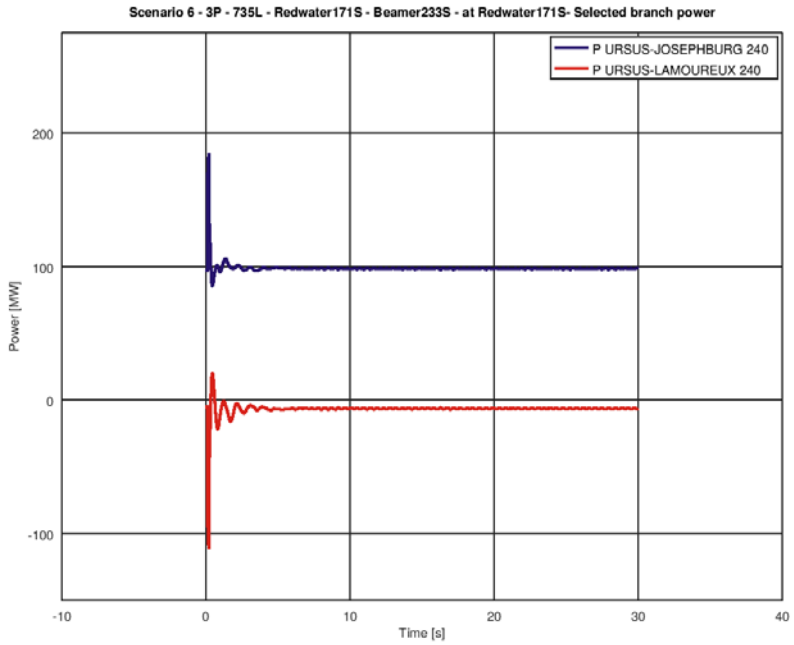


Figure A-414 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

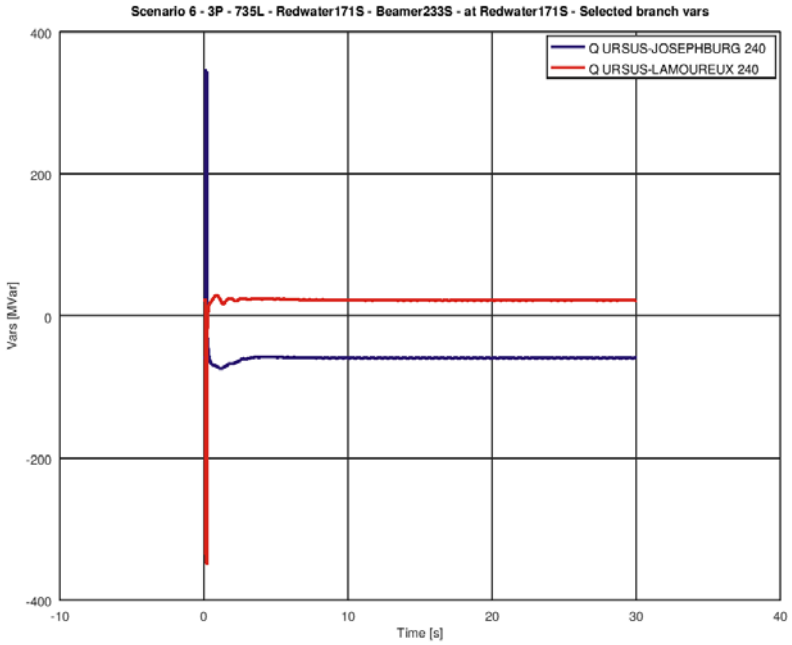


Figure A-415 Scenario 6 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

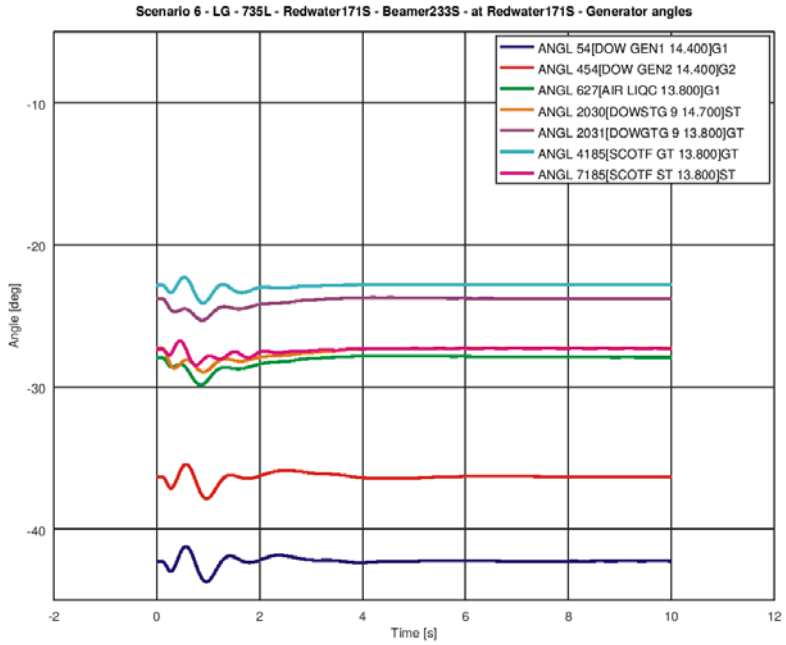


Figure A-416 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

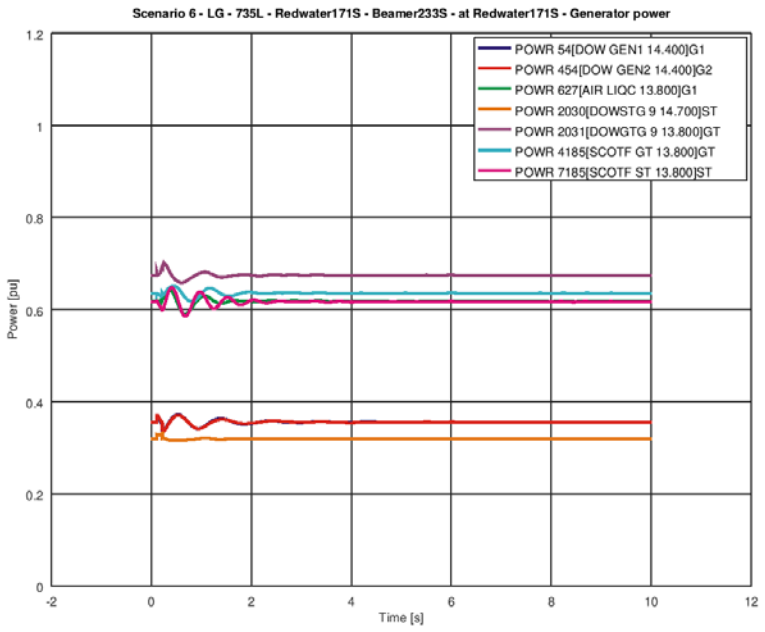


Figure A-417 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

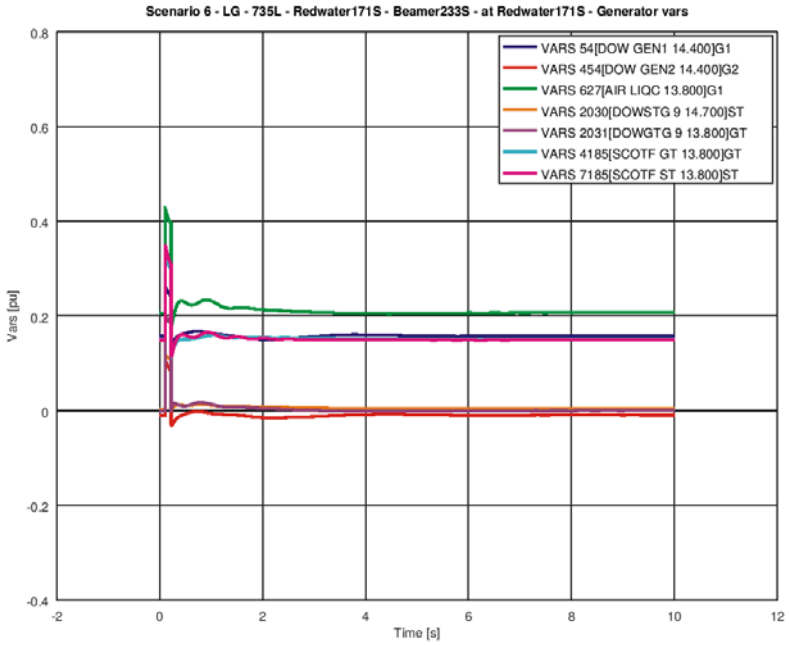


Figure A-418 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

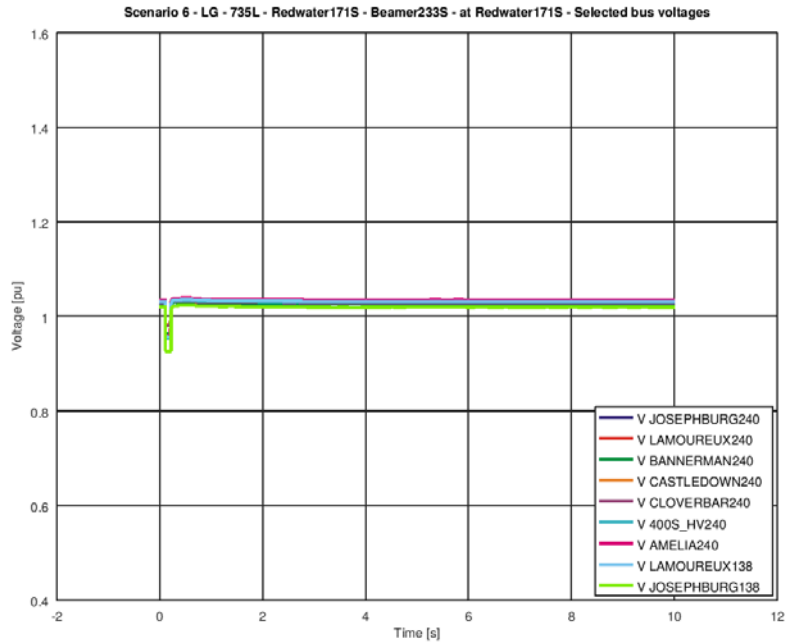


Figure A-419 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

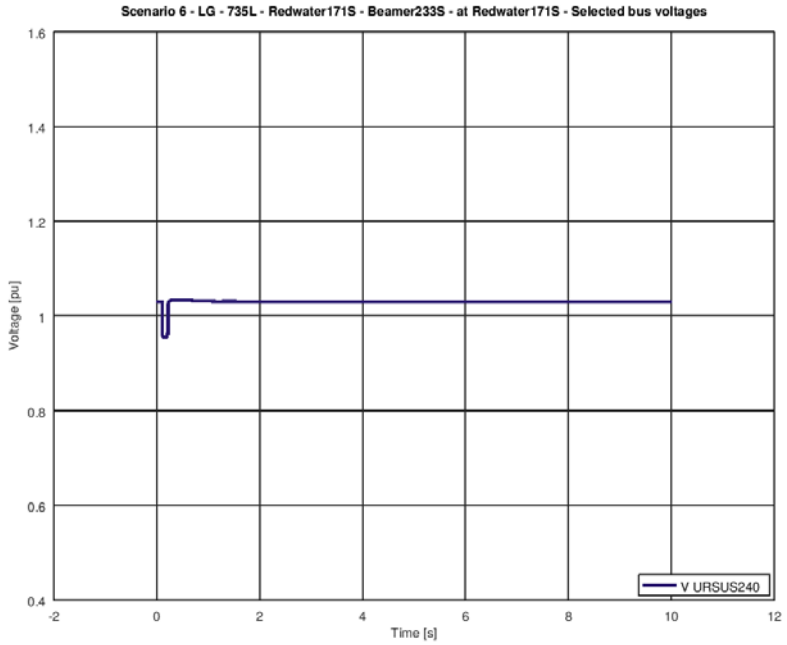


Figure A-420 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

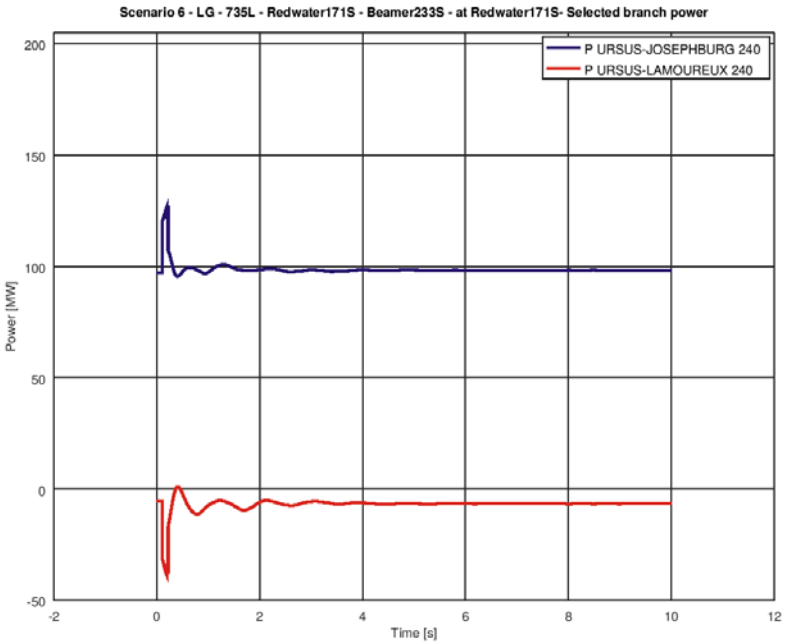


Figure A-421 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

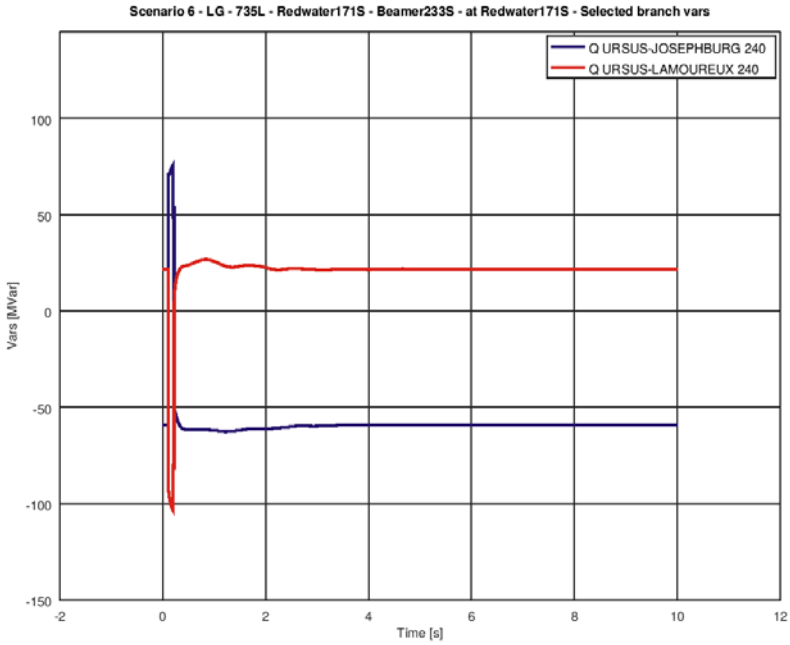


Figure A-422 Scenario 6 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

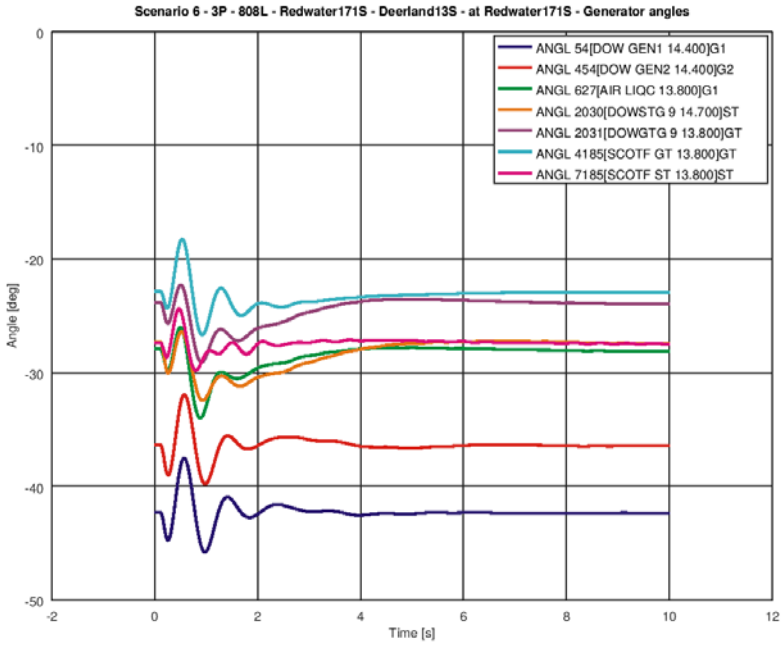


Figure A-423 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

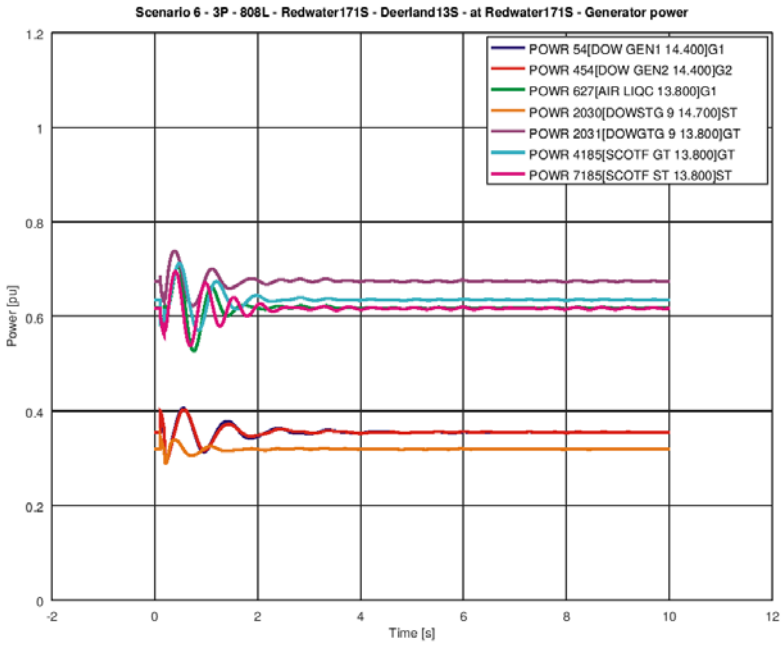


Figure A-424 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

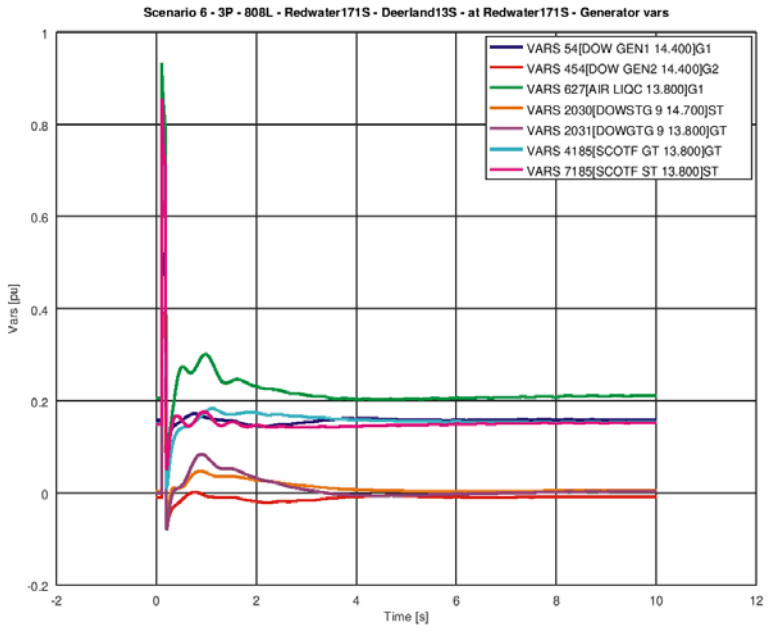


Figure A-425 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

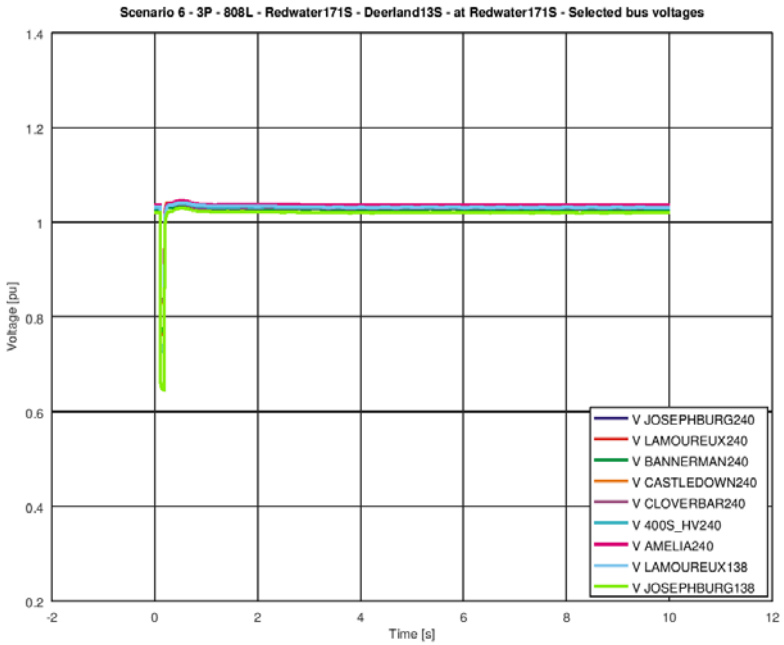


Figure A-426 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

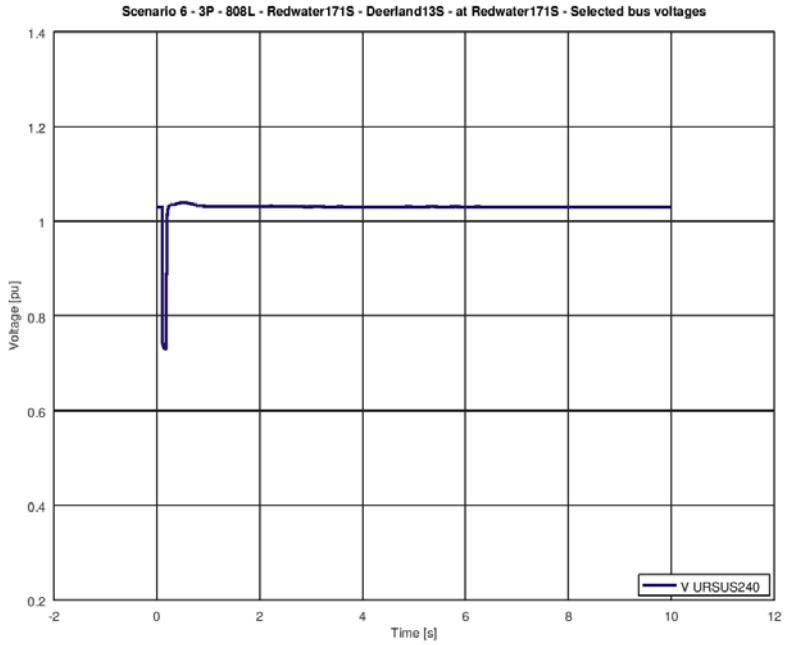


Figure A-427 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

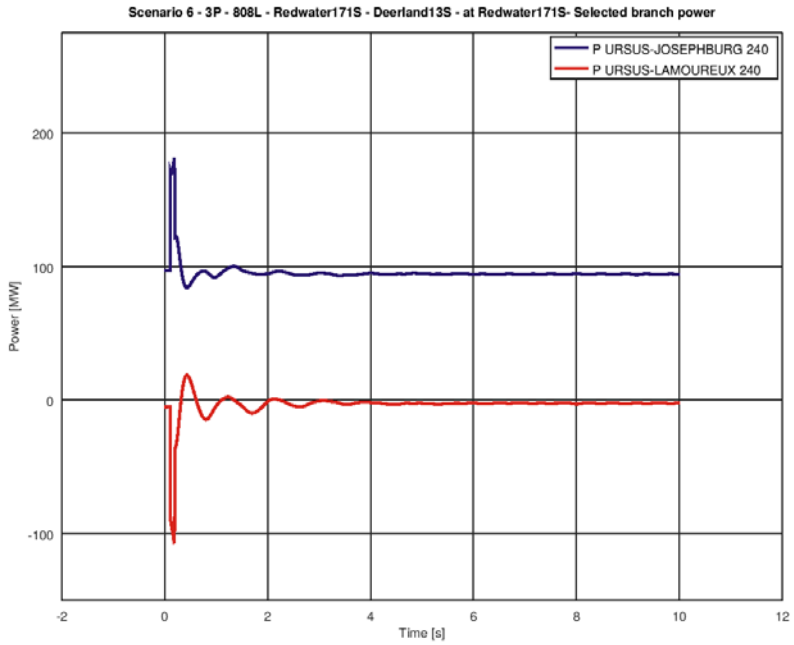


Figure A-428 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

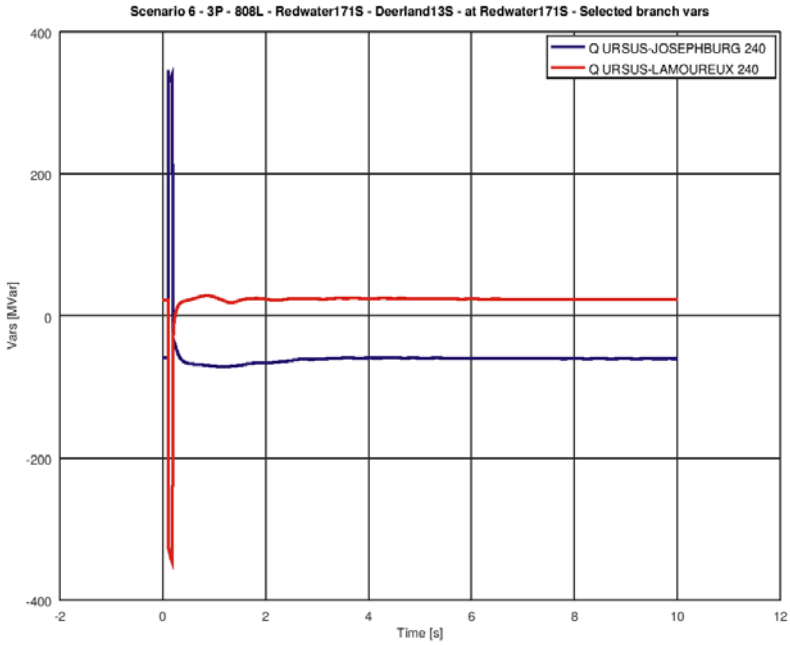


Figure A-429 Scenario 6 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

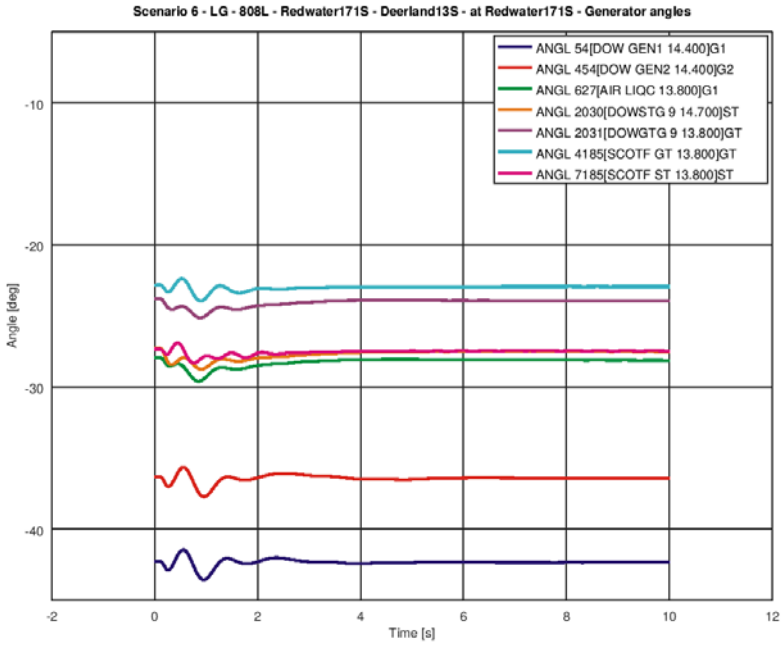


Figure A-430 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

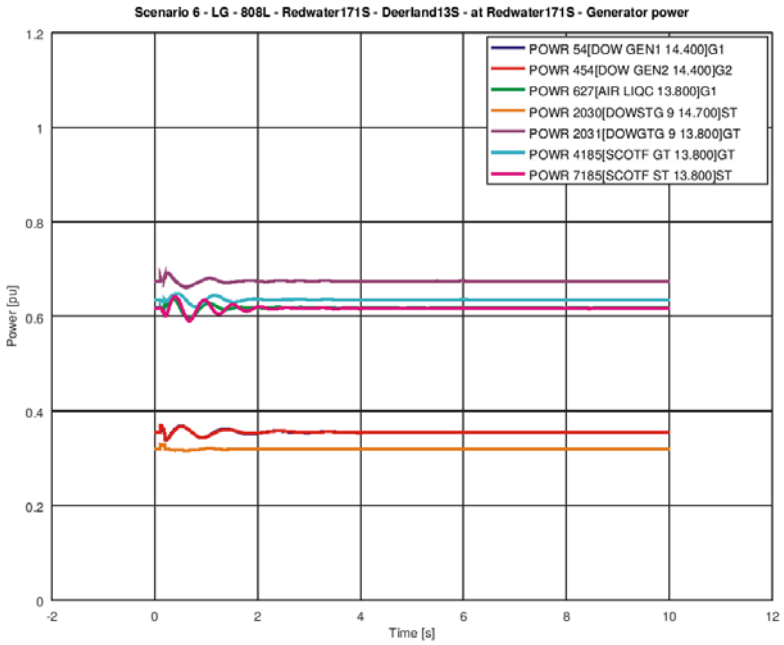


Figure A-431 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

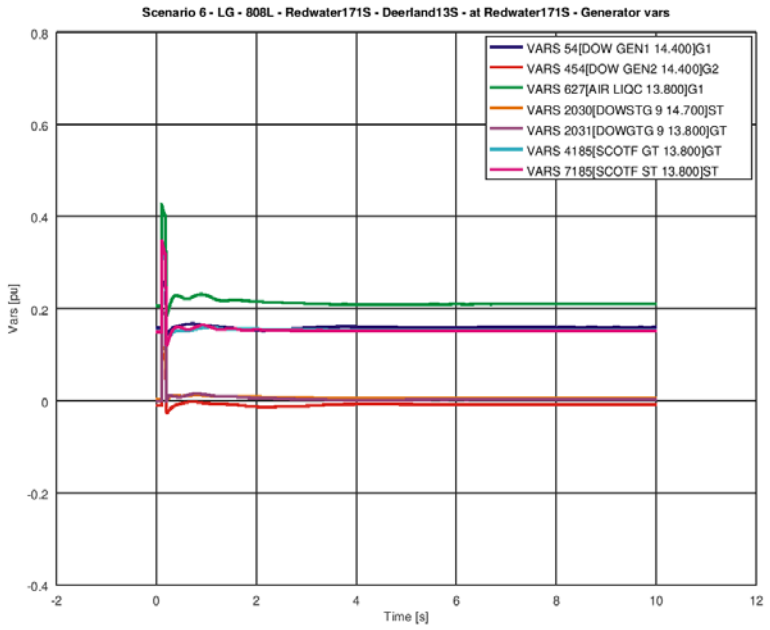


Figure A-432 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

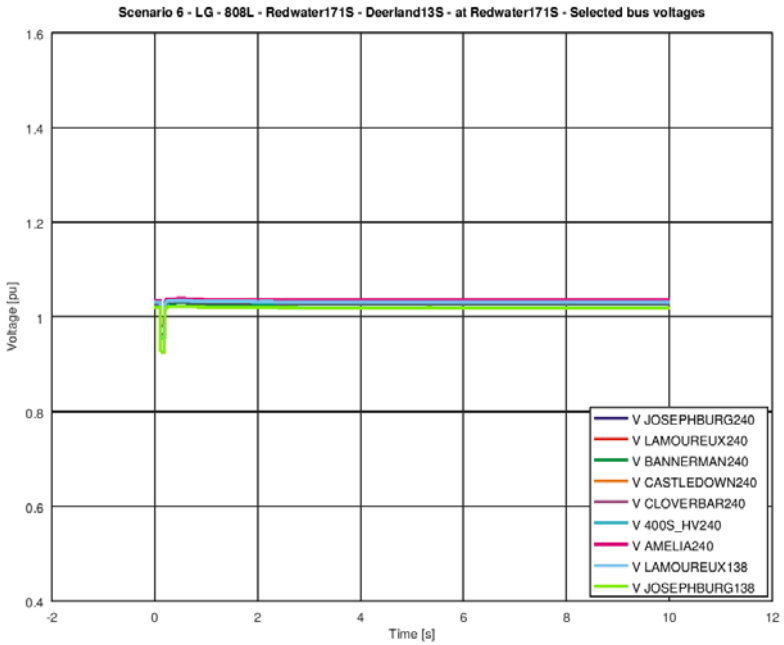


Figure A-433 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

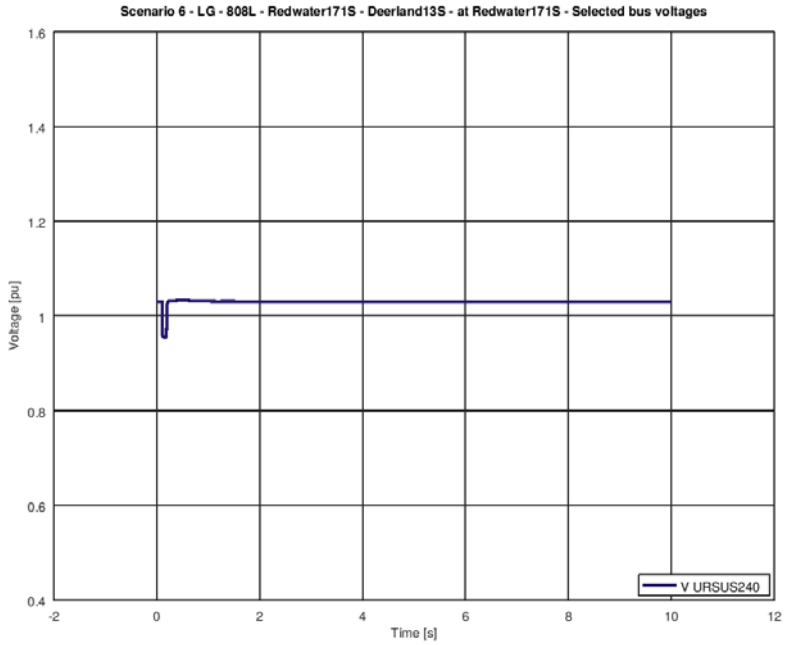


Figure A-434 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

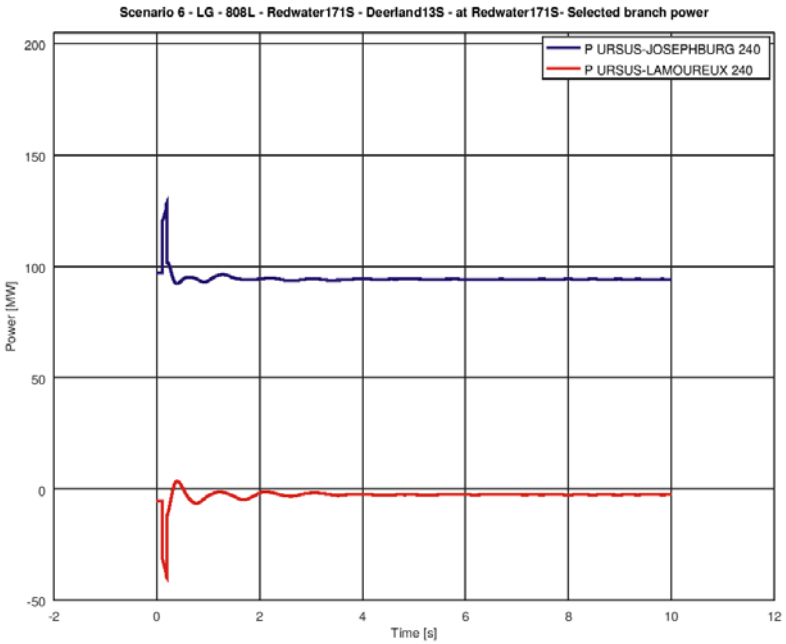


Figure A-435 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

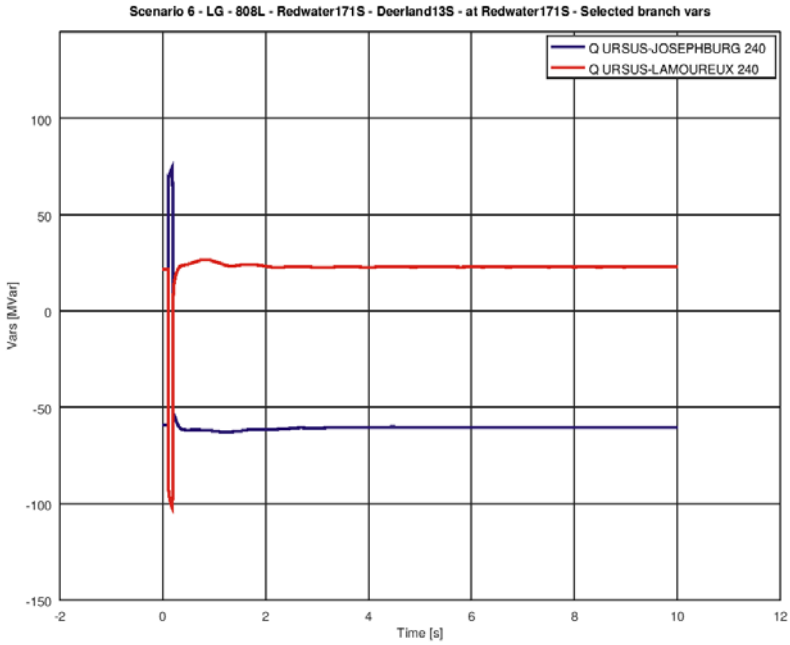


Figure A-436 Scenario 6 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

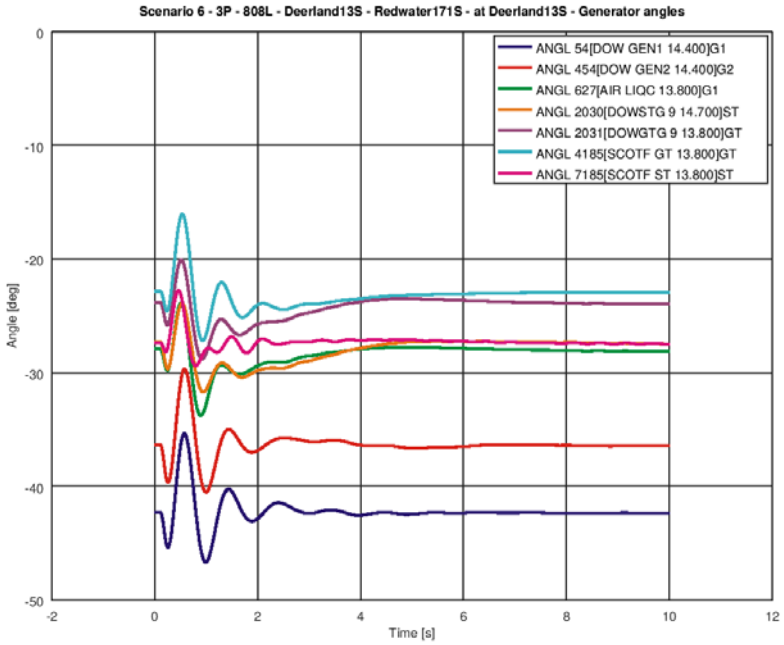


Figure A-437 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

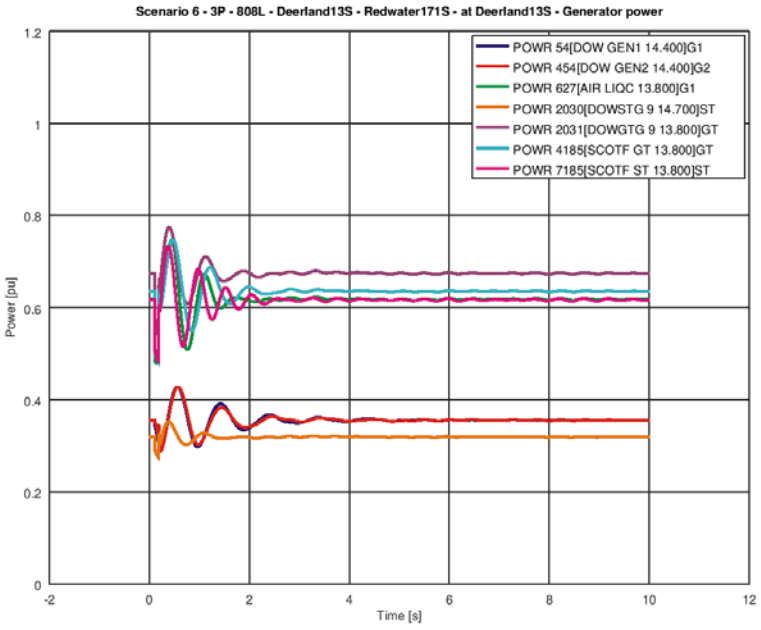


Figure A-438 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

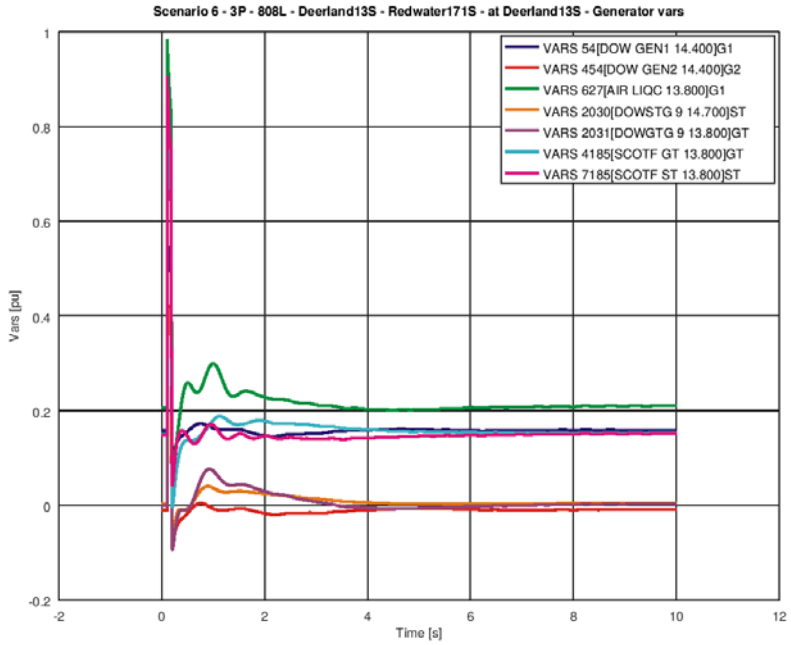


Figure A-439 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

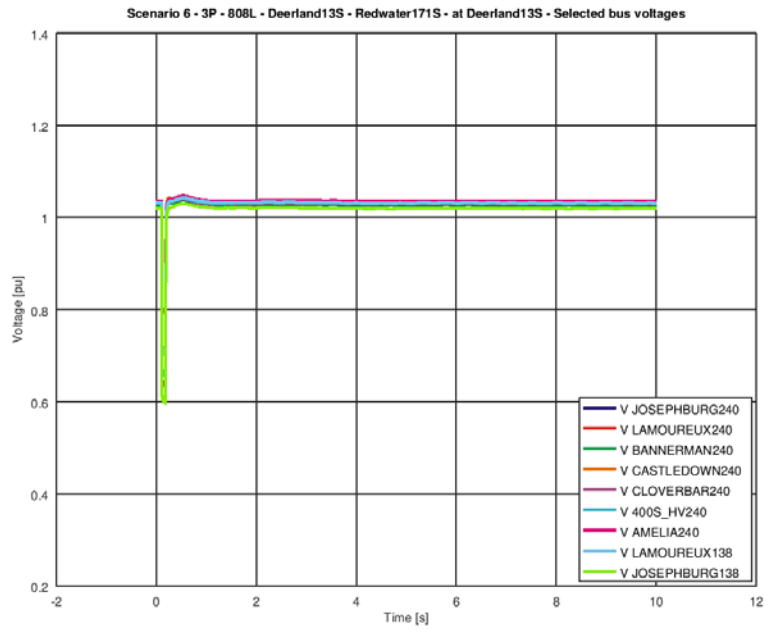


Figure A-440 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

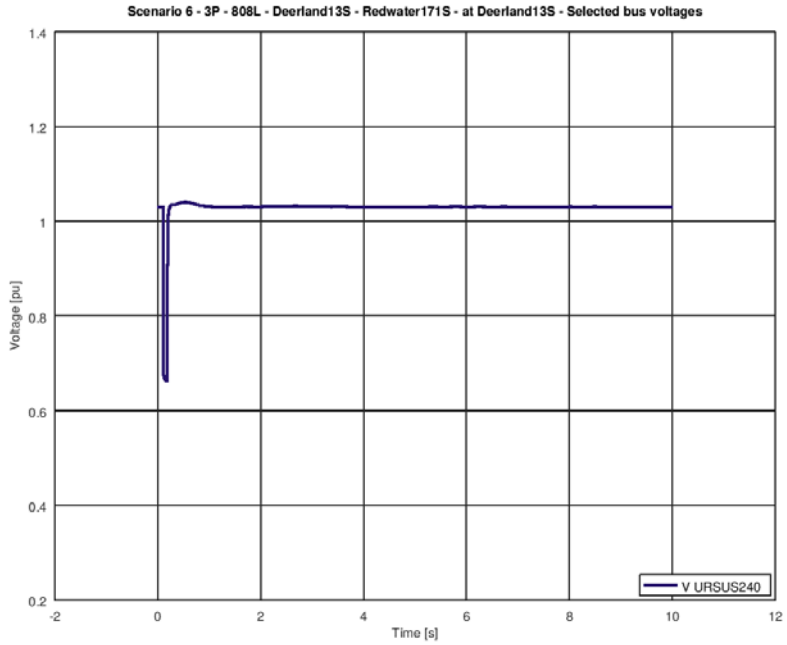


Figure A-441 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

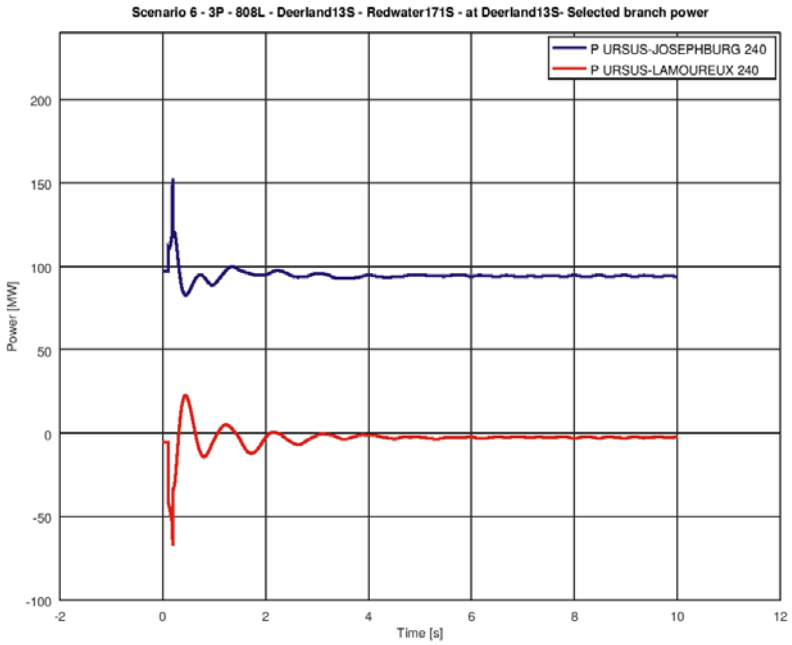


Figure A-442 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

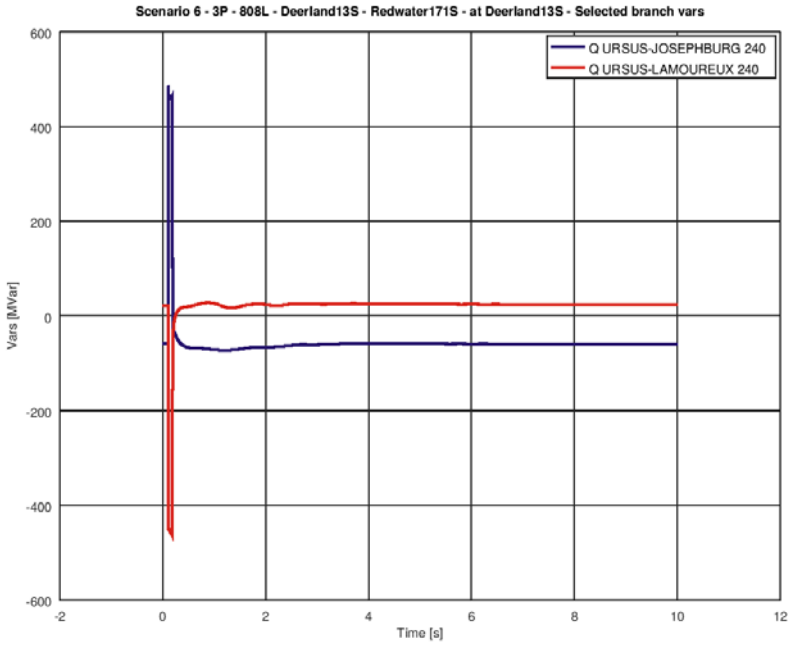


Figure A-443 Scenario 6 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

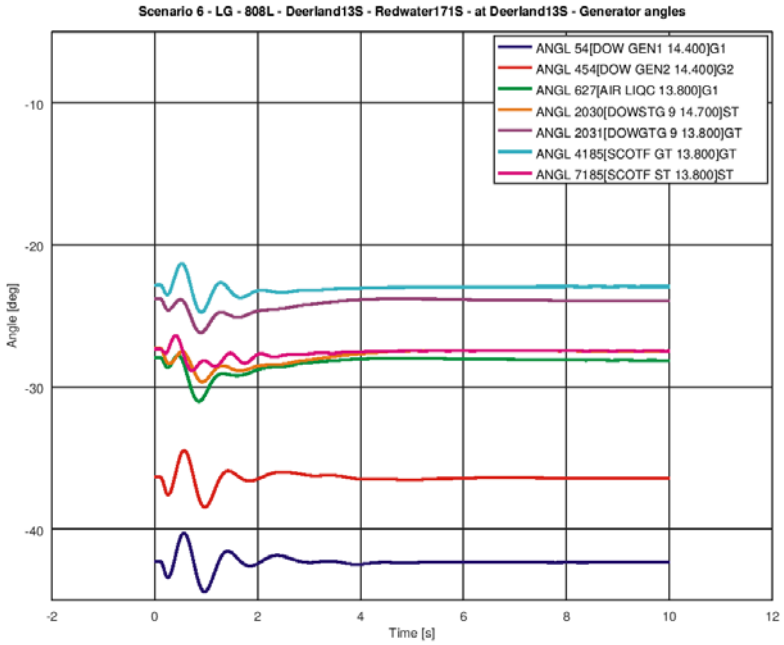


Figure A-444 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

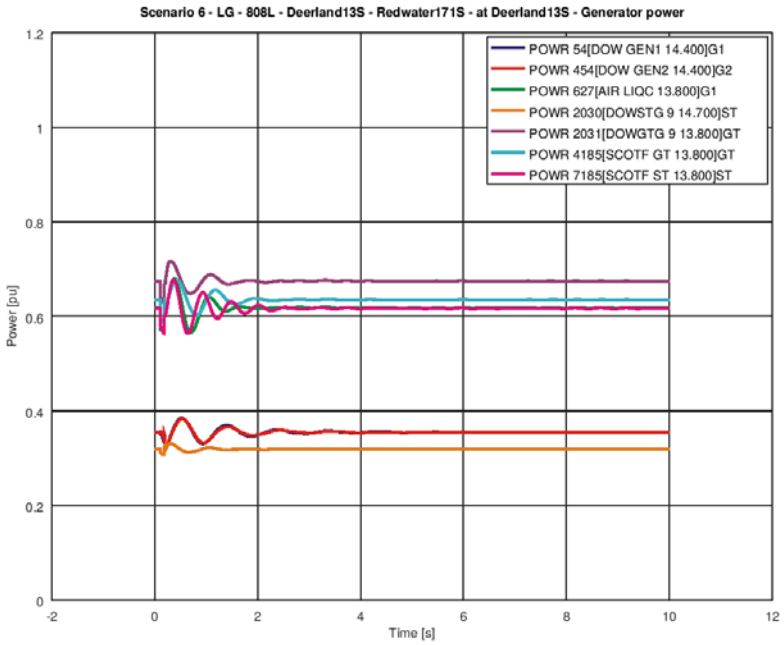


Figure A-445 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

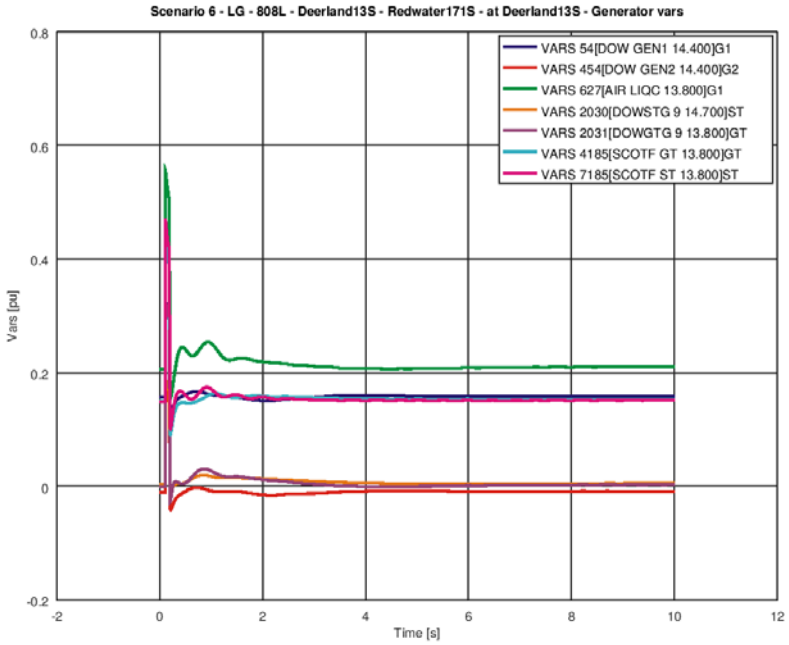


Figure A-446 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

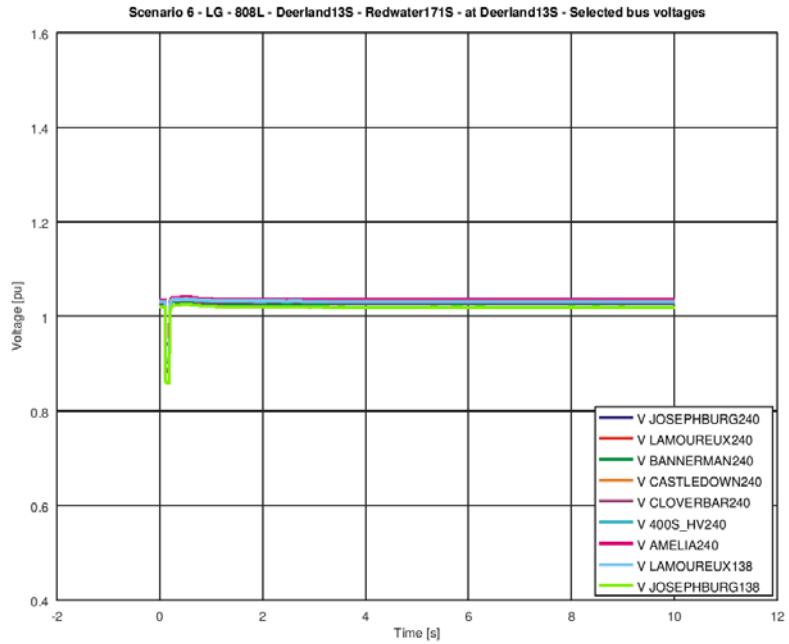


Figure A-447 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

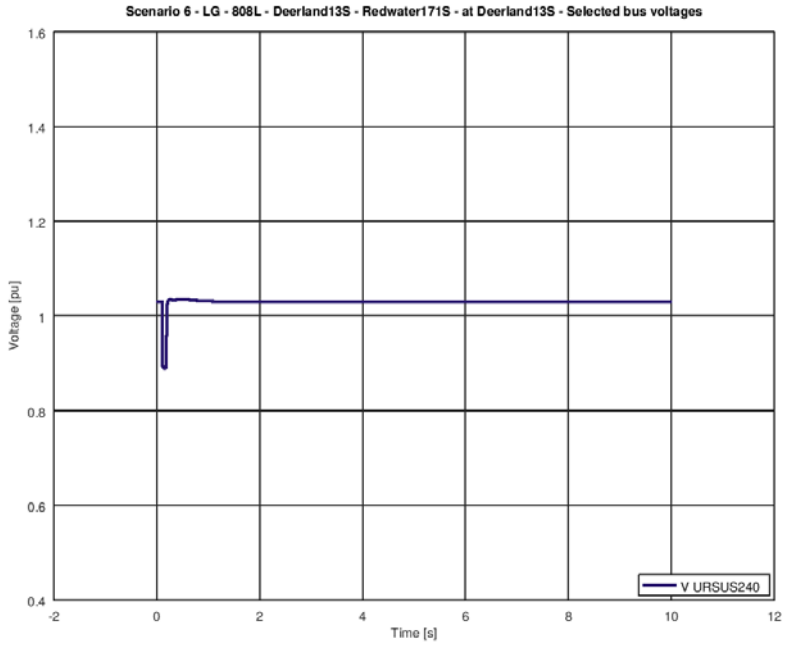


Figure A-448 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

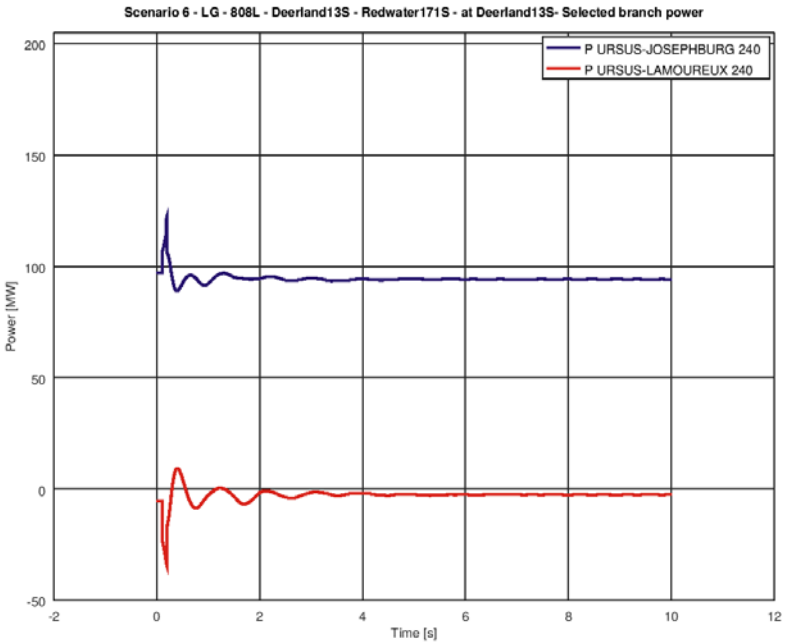


Figure A-449 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

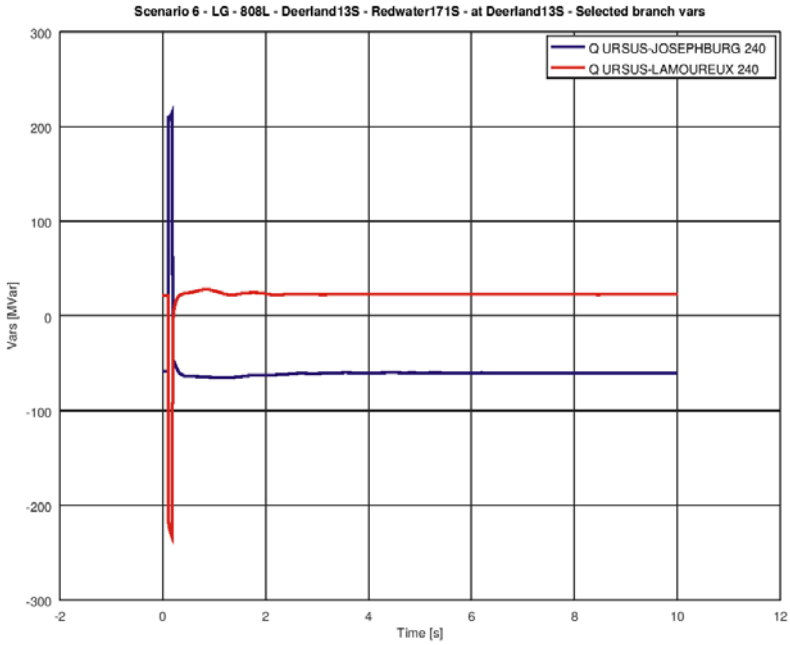


Figure A-450 Scenario 6 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

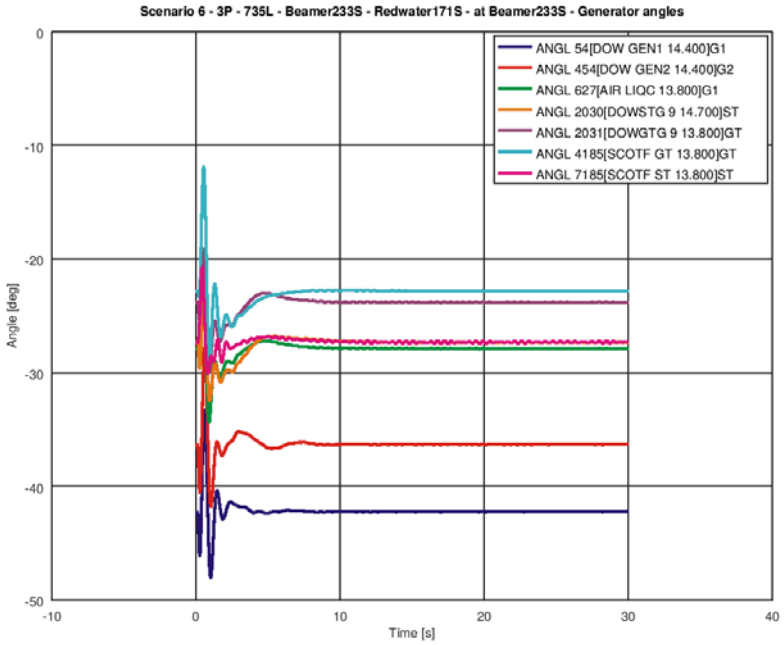


Figure A-451 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

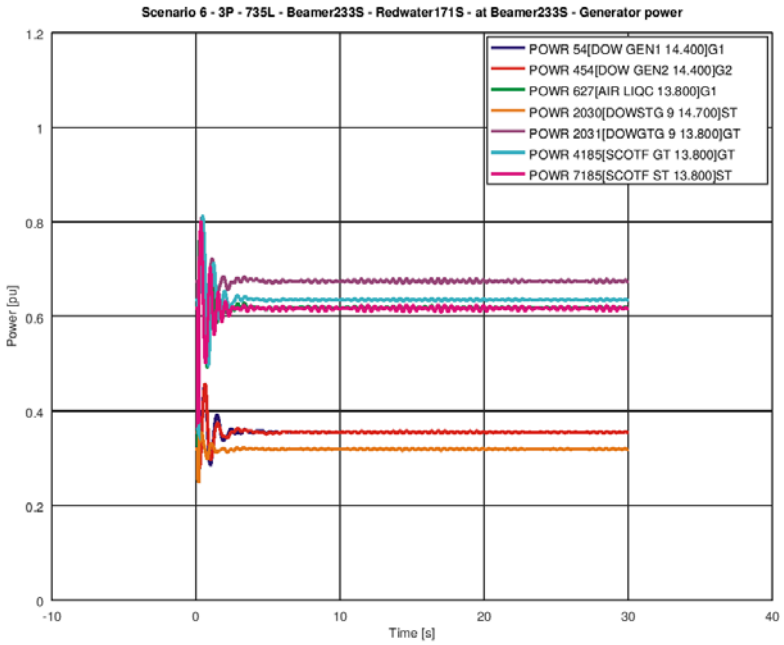


Figure A-452 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

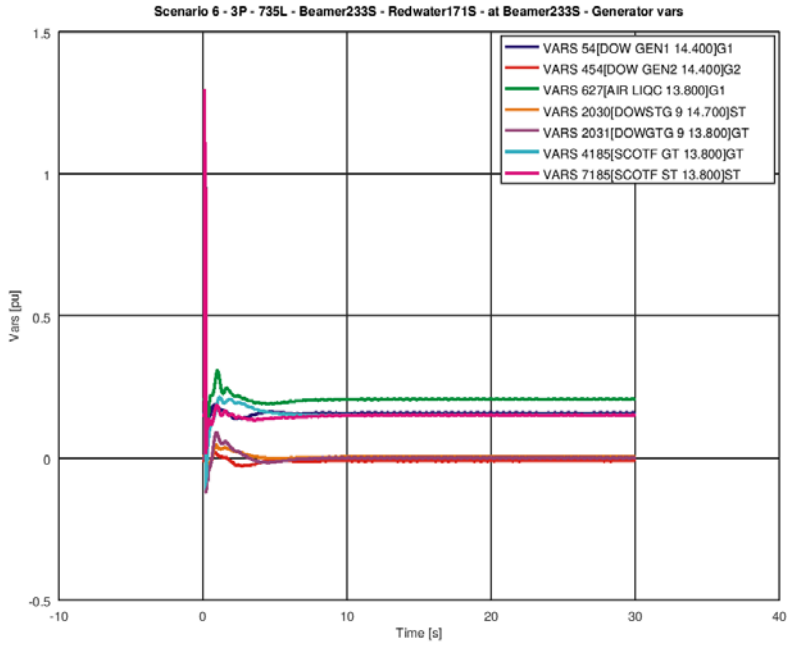


Figure A-453 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

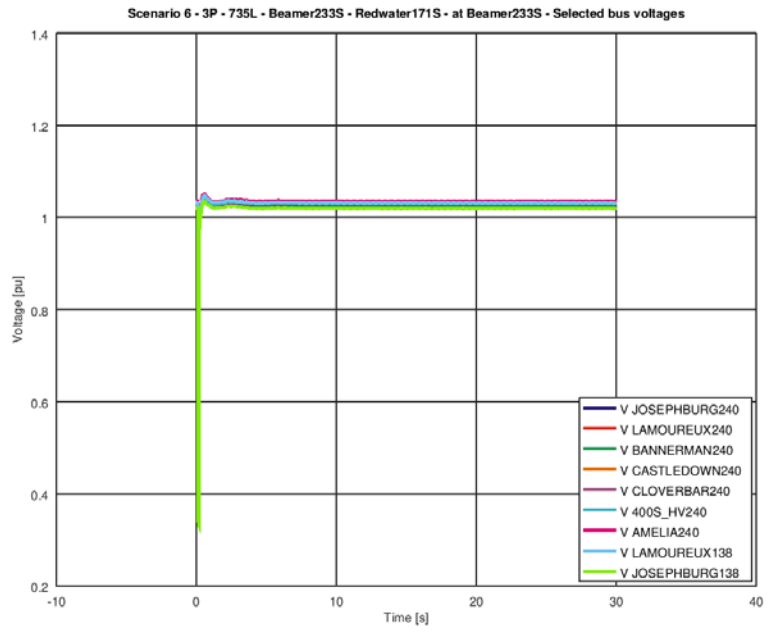


Figure A-454 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

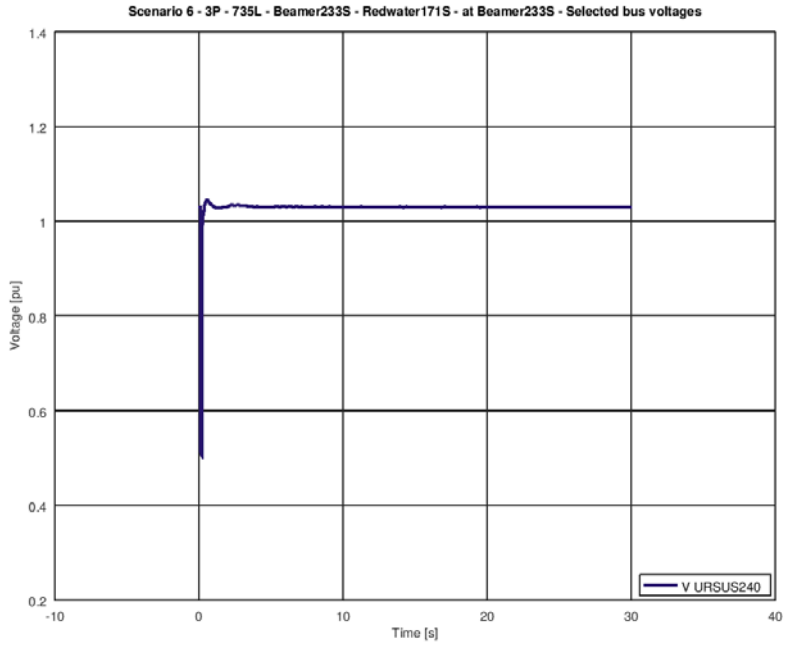


Figure A-455 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

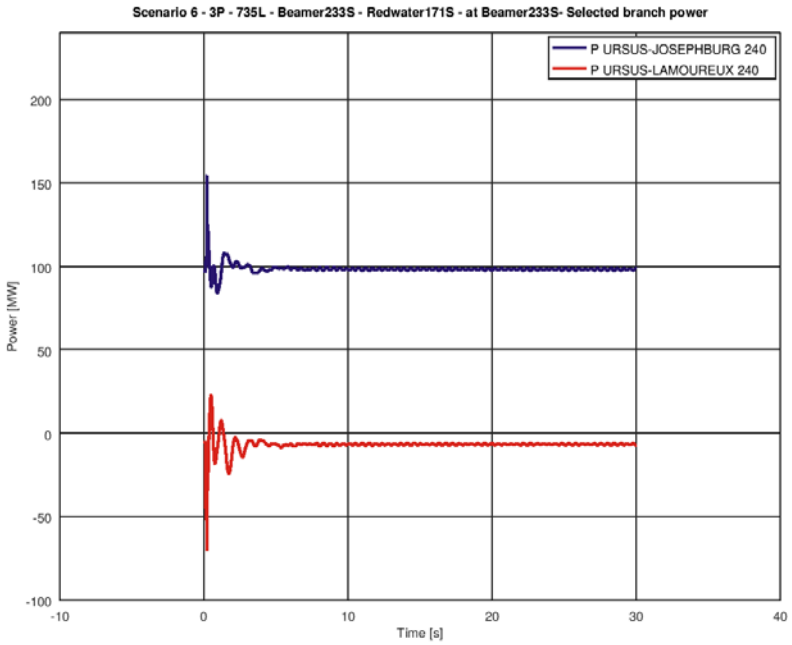


Figure A-456 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

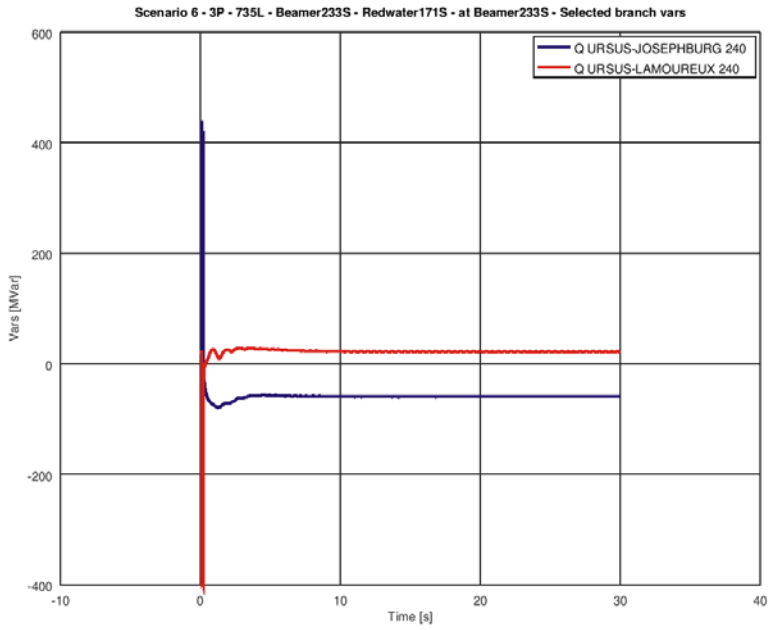


Figure A-457 Scenario 6 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

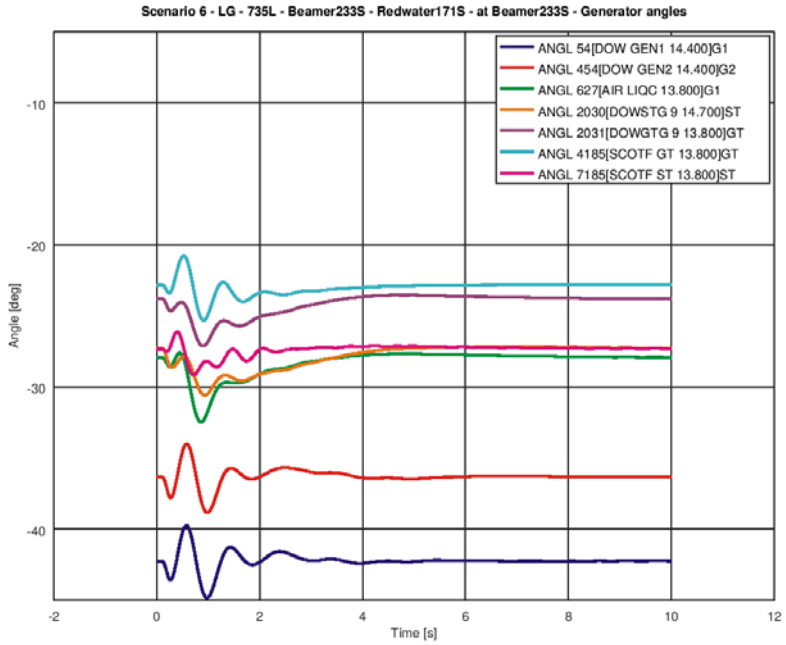


Figure A-458 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

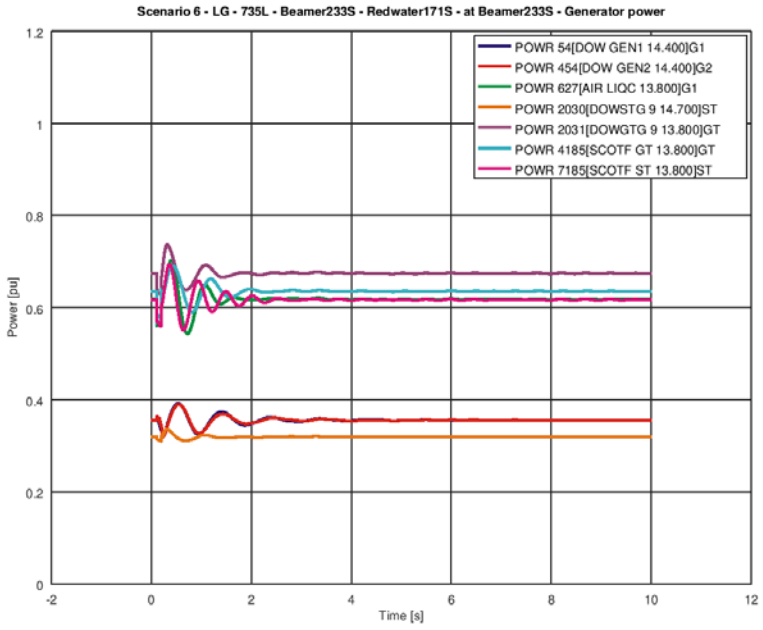


Figure A-459 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

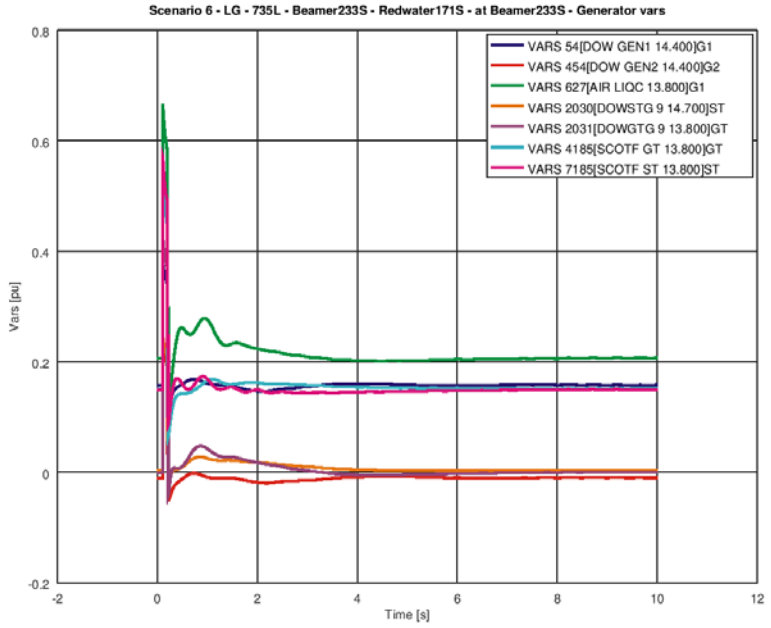


Figure A-460 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

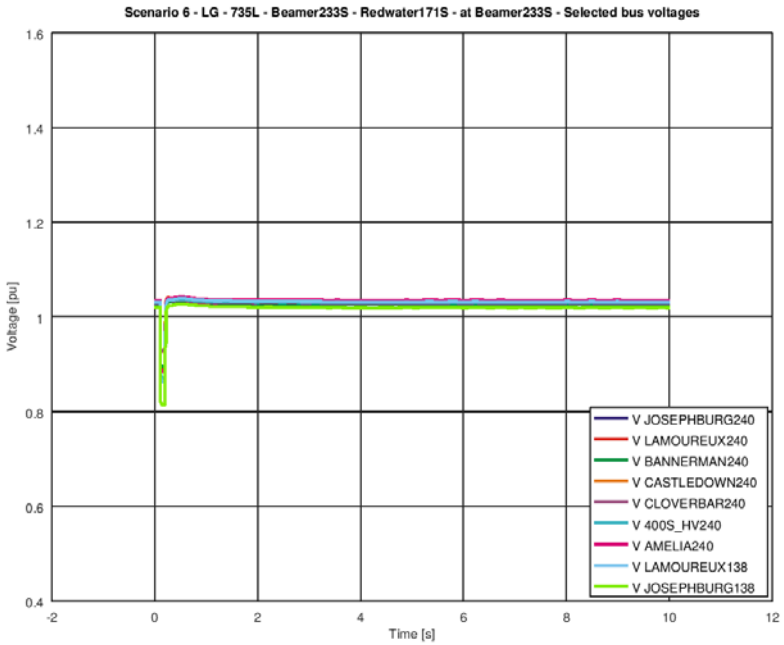


Figure A-461 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

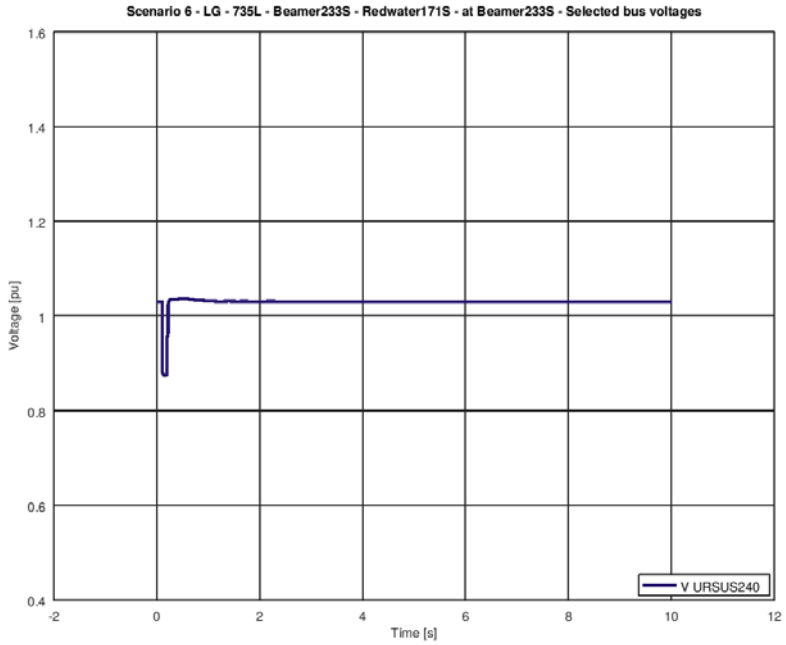


Figure A-462 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

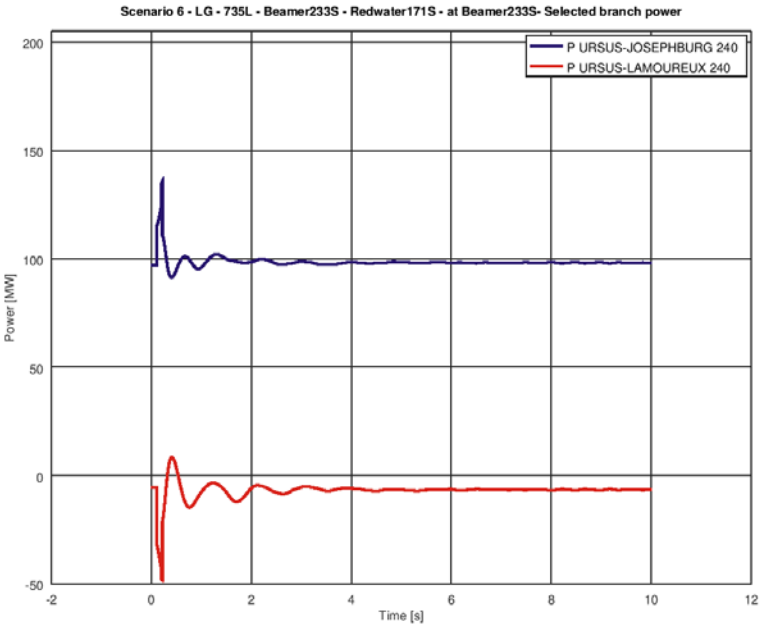


Figure A-463 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

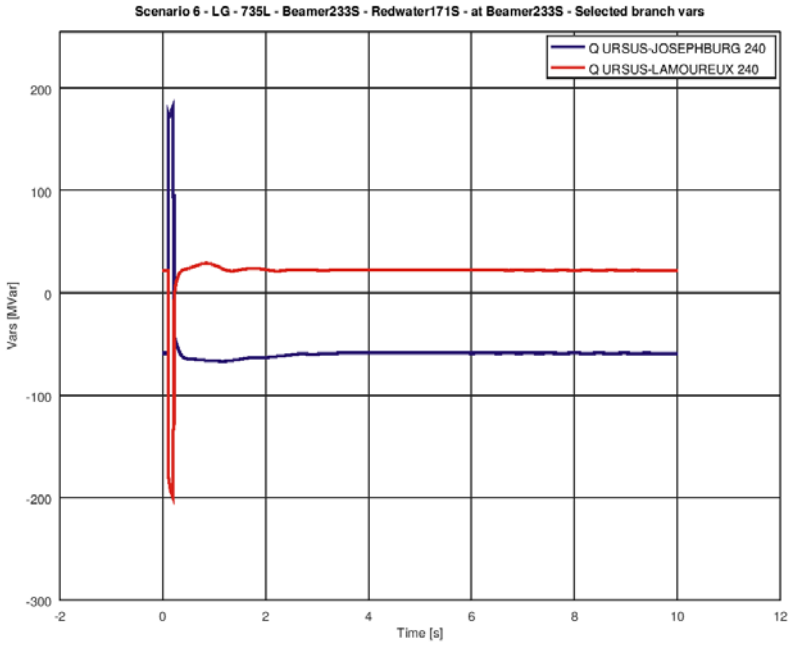


Figure A-464 Scenario 6 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

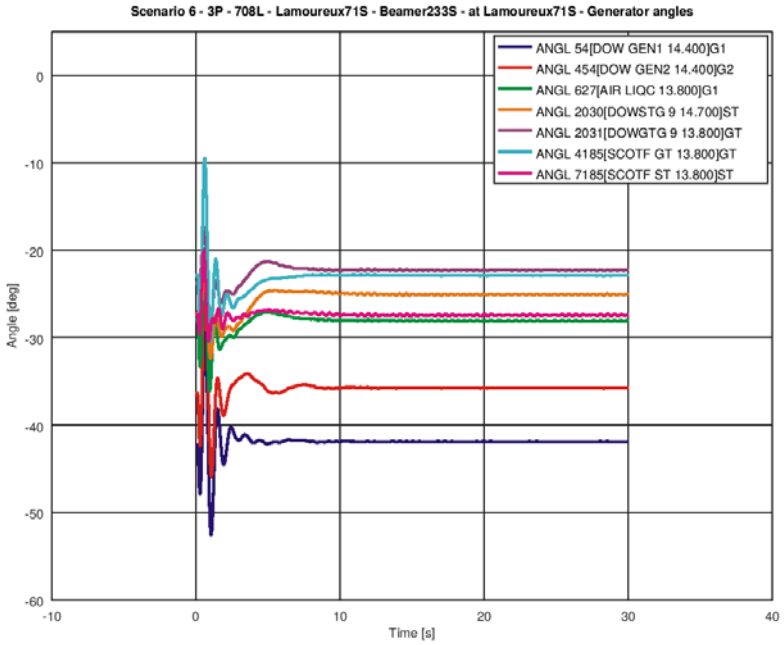


Figure A-465 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

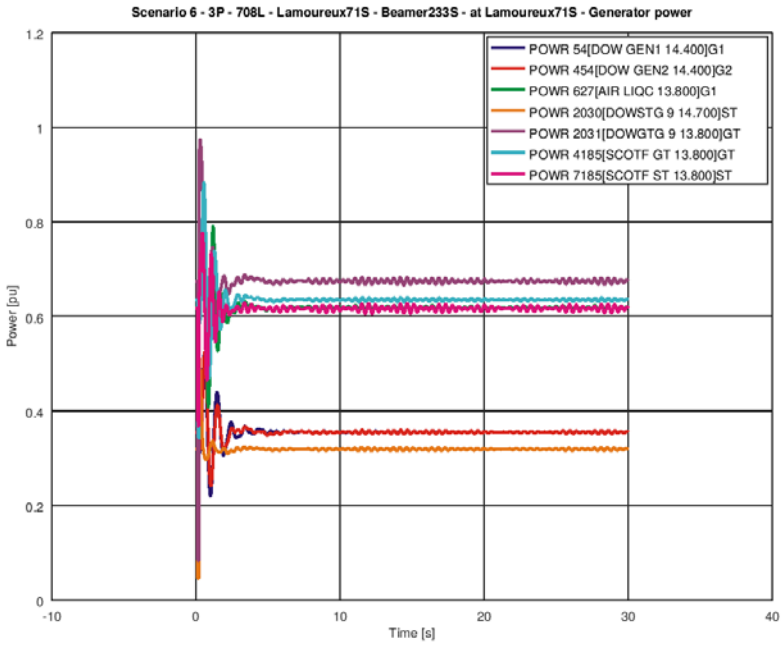


Figure A-466 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

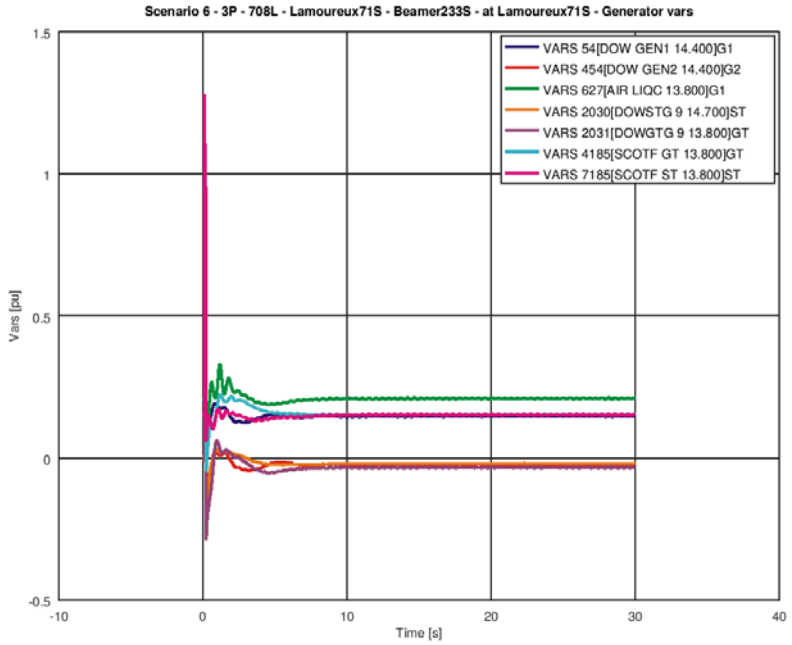


Figure A-467 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

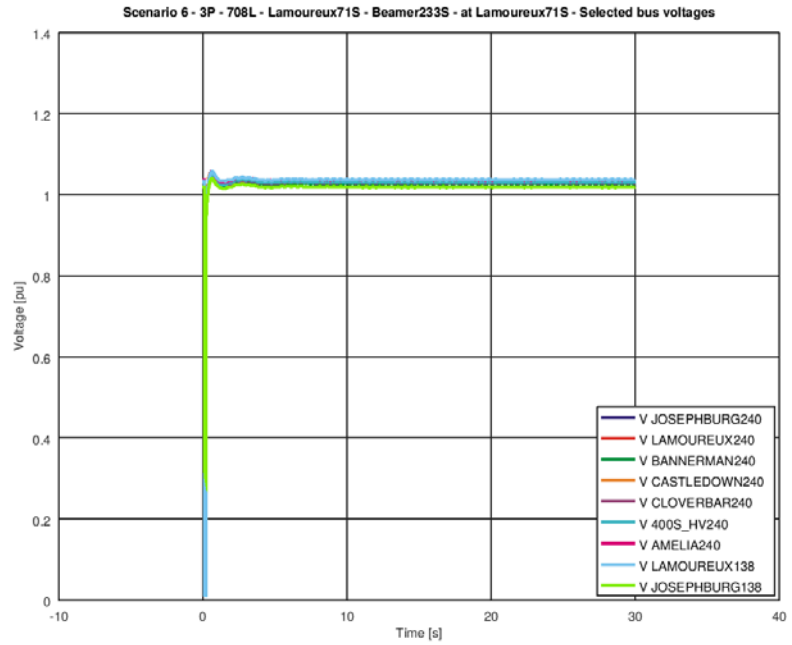


Figure A-468 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

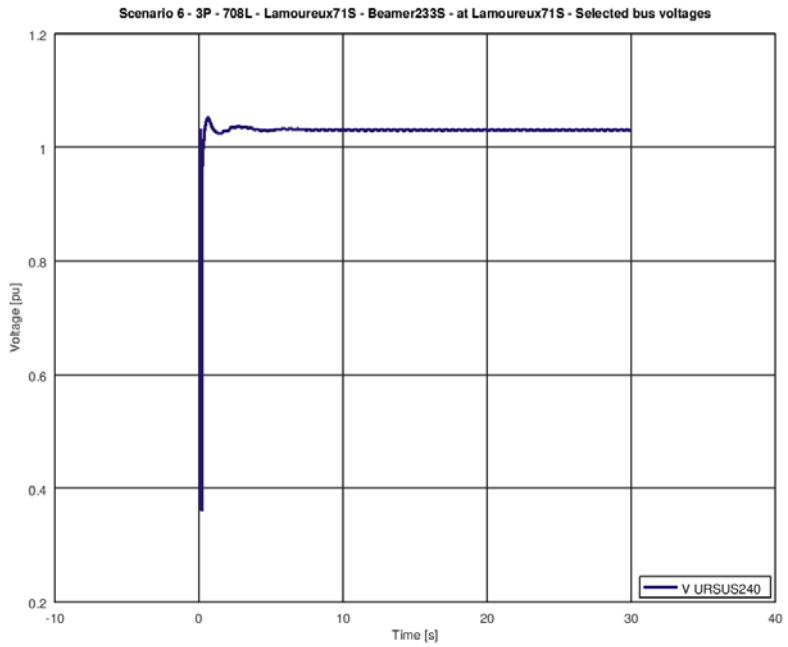


Figure A-469 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

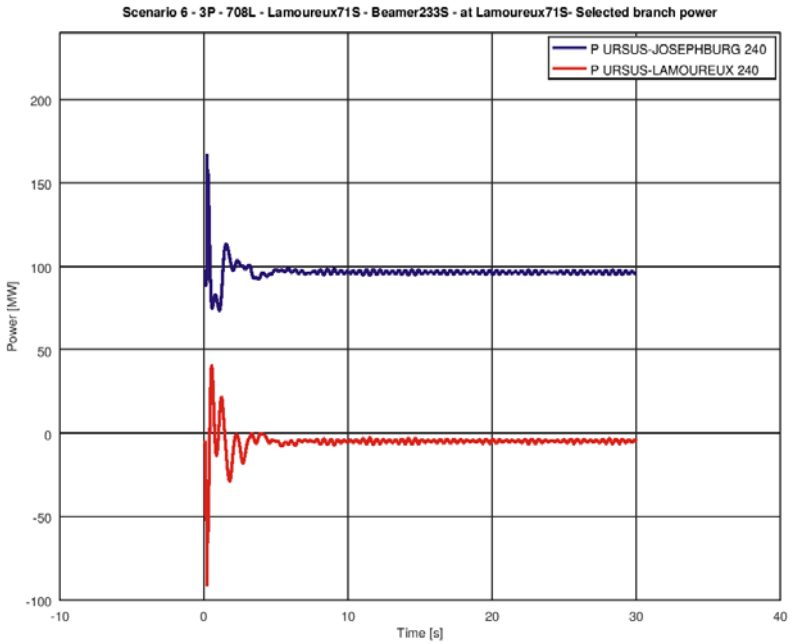


Figure A-470 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

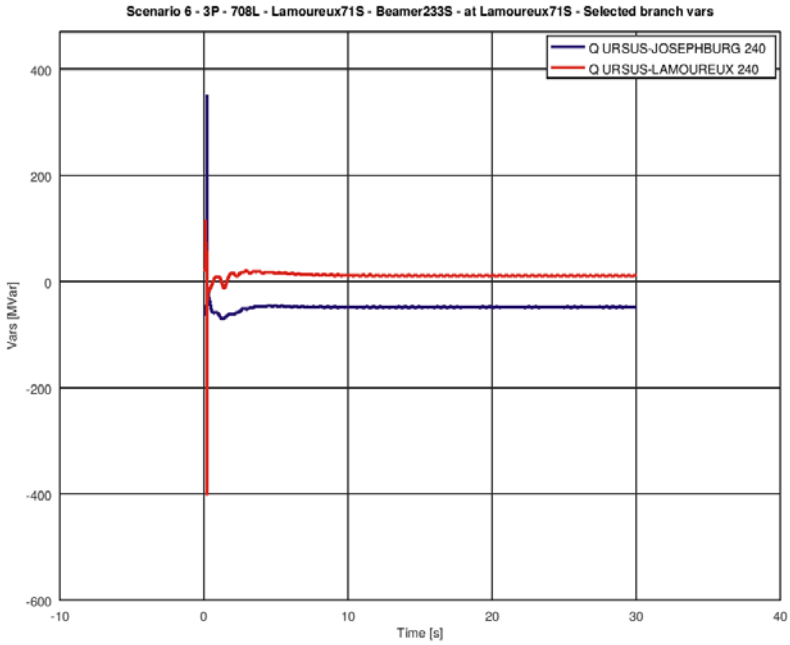


Figure A-471 Scenario 6 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

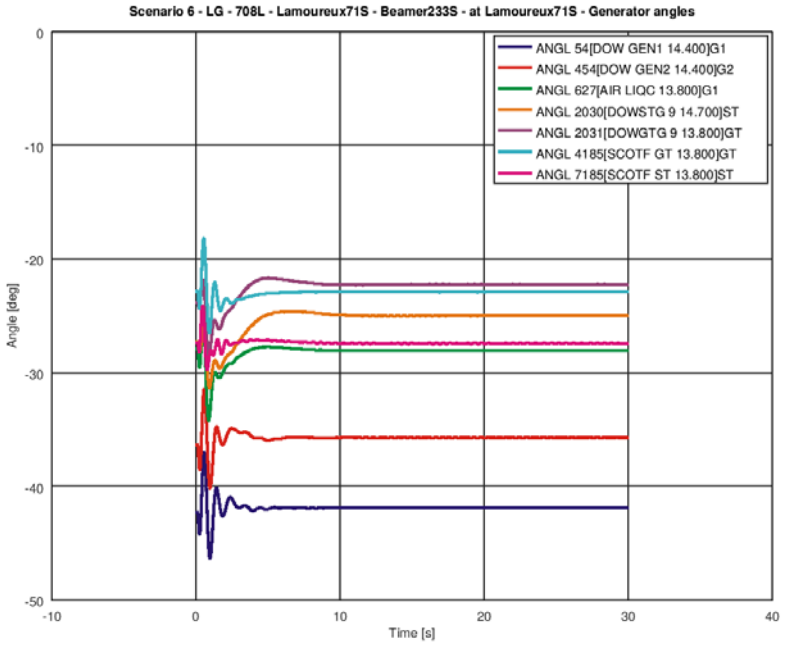


Figure A-472 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

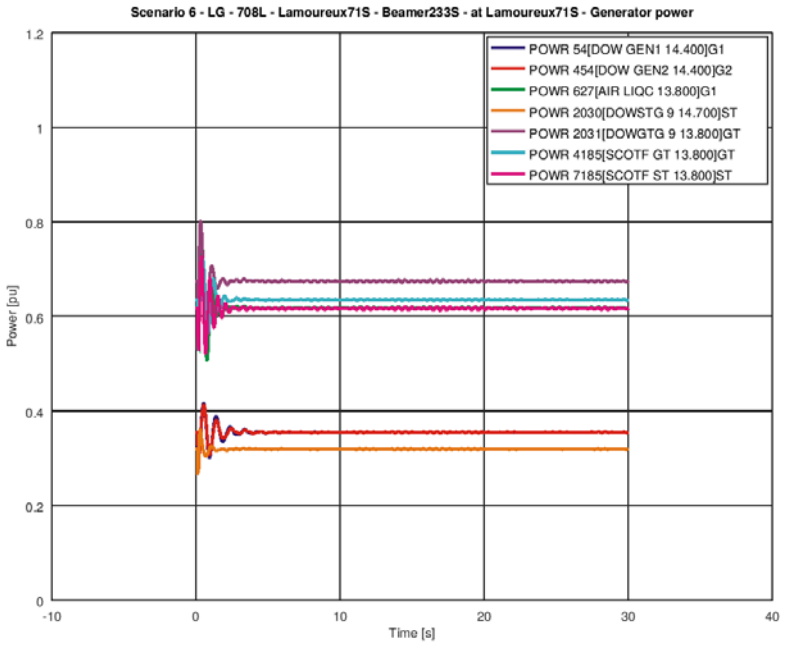


Figure A-473 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

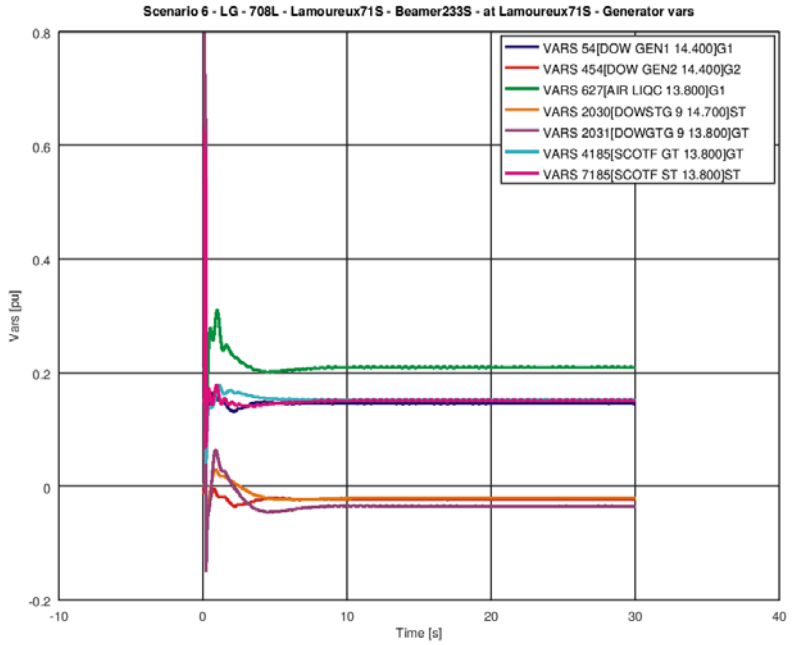


Figure A-474 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

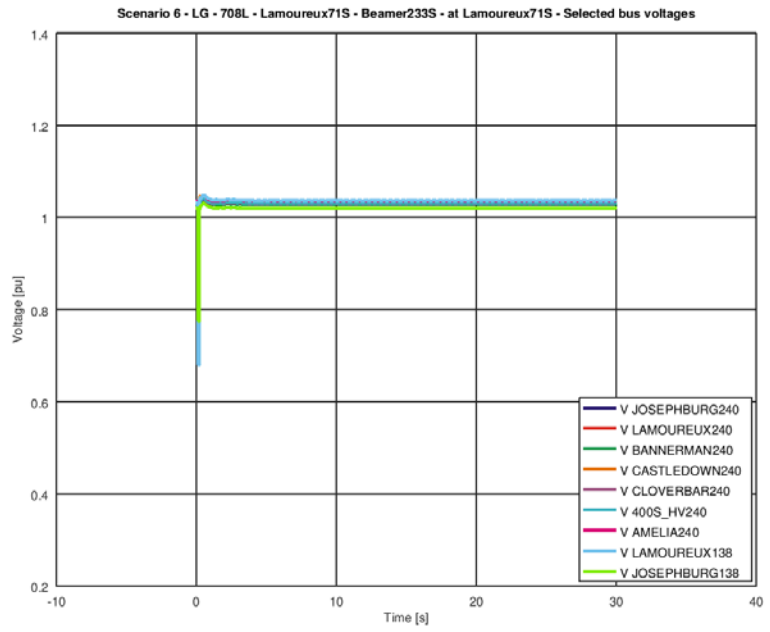


Figure A-475 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

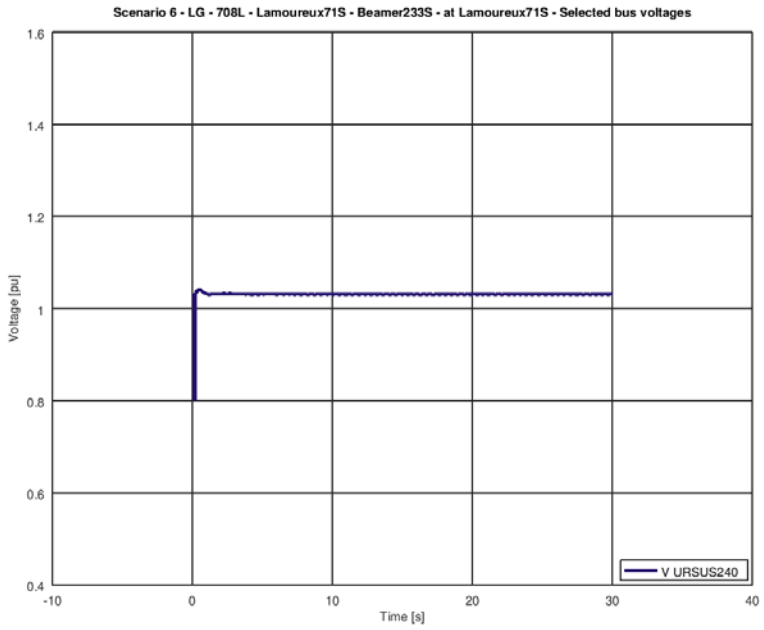


Figure A-476 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

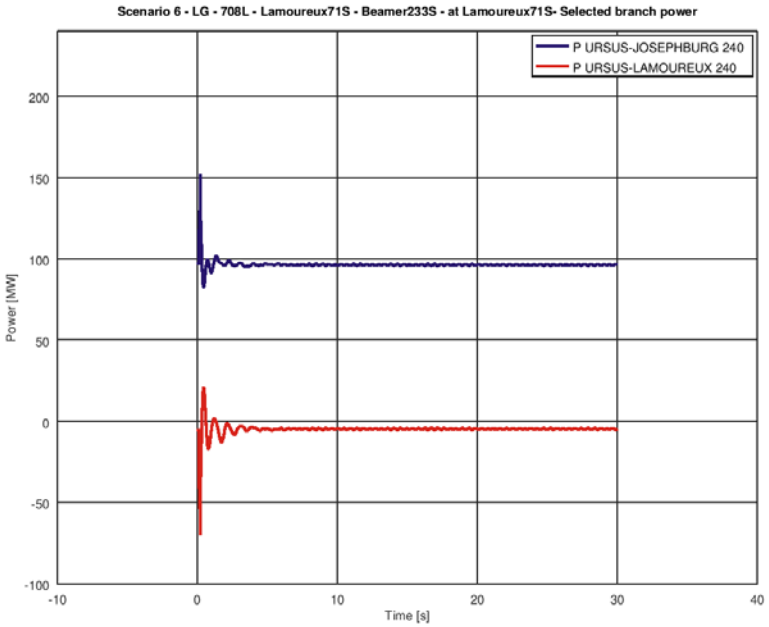


Figure A-477 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

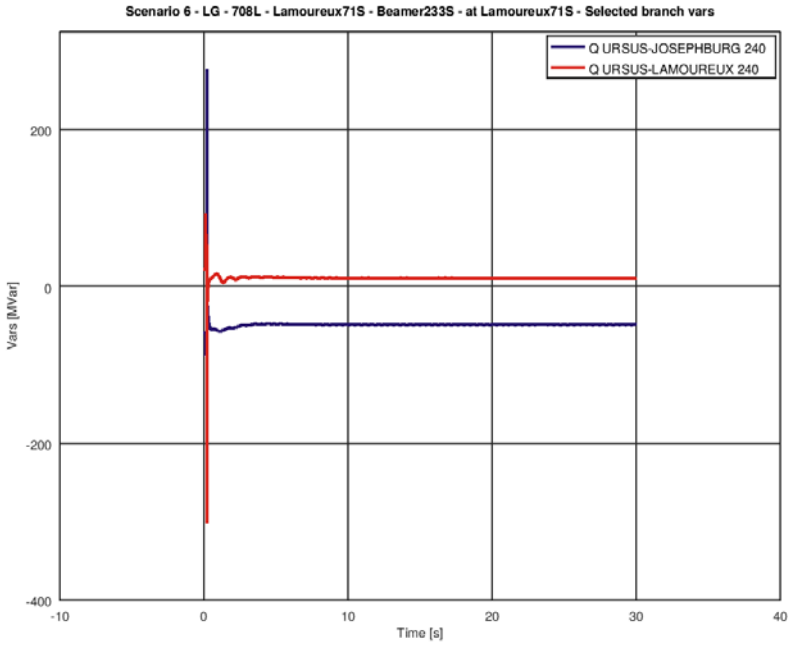


Figure A-478 Scenario 6 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

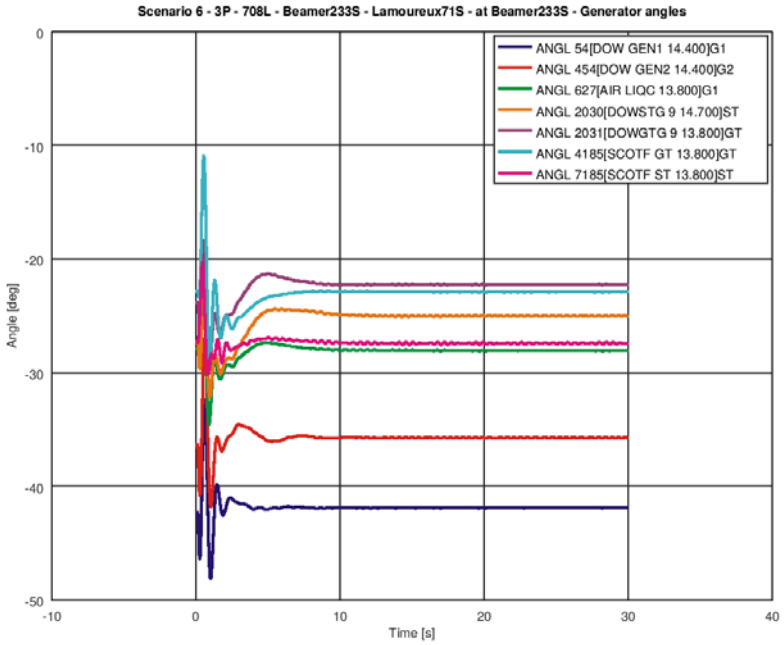


Figure A-479 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

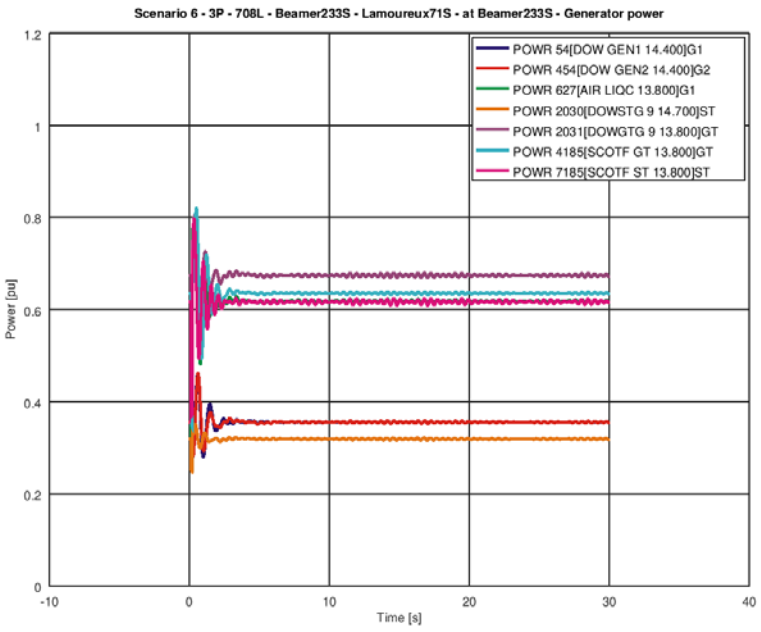


Figure A-480 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

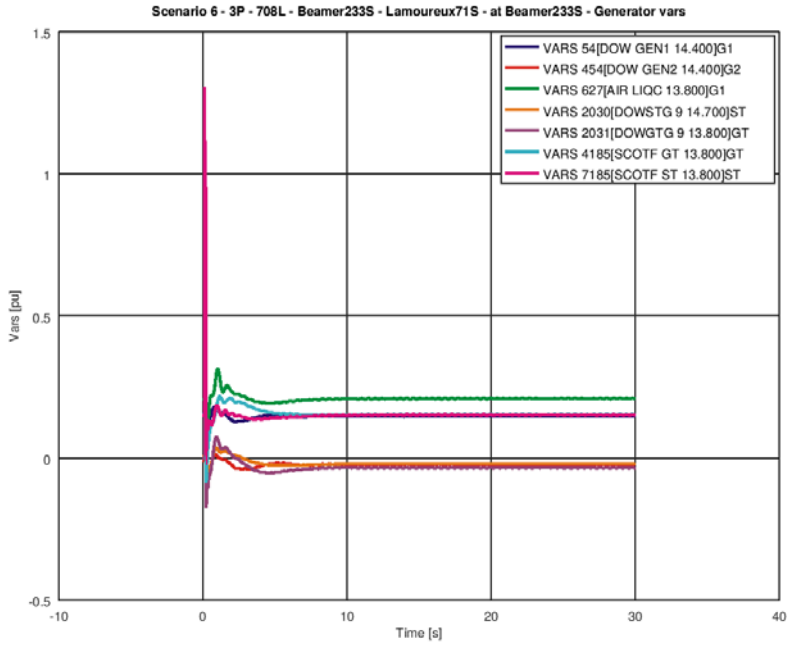


Figure A-481 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

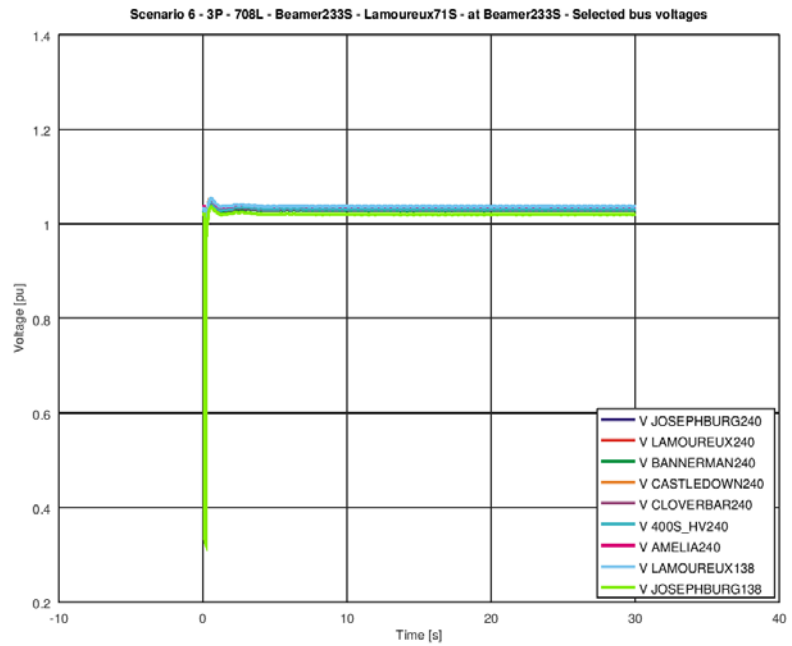


Figure A-482 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

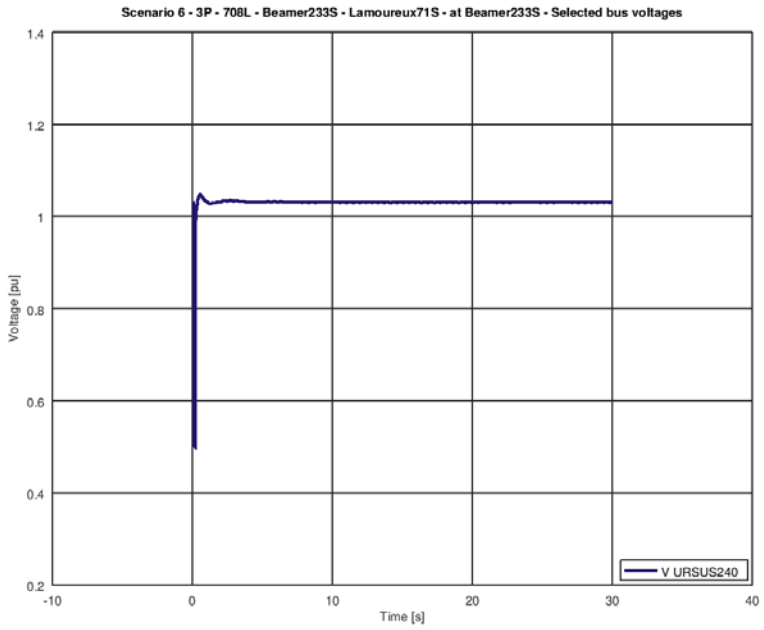


Figure A-483 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

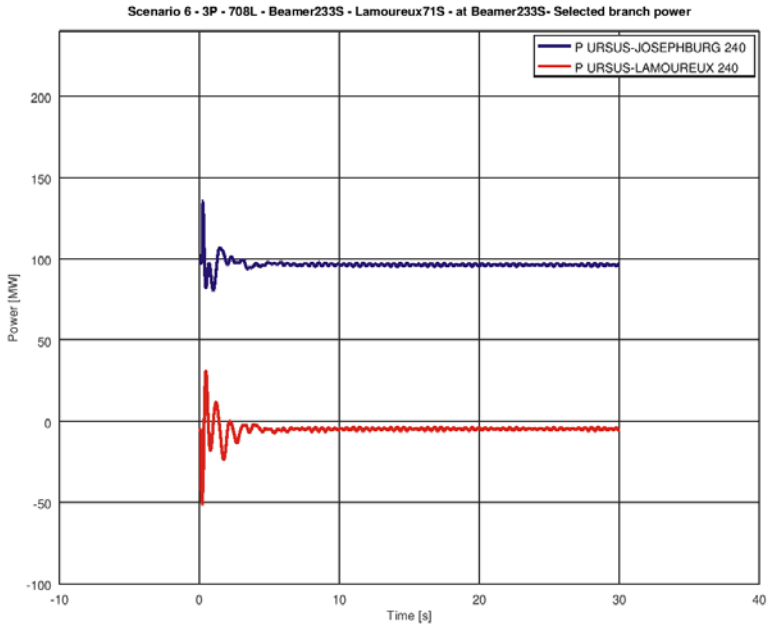


Figure A-484 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

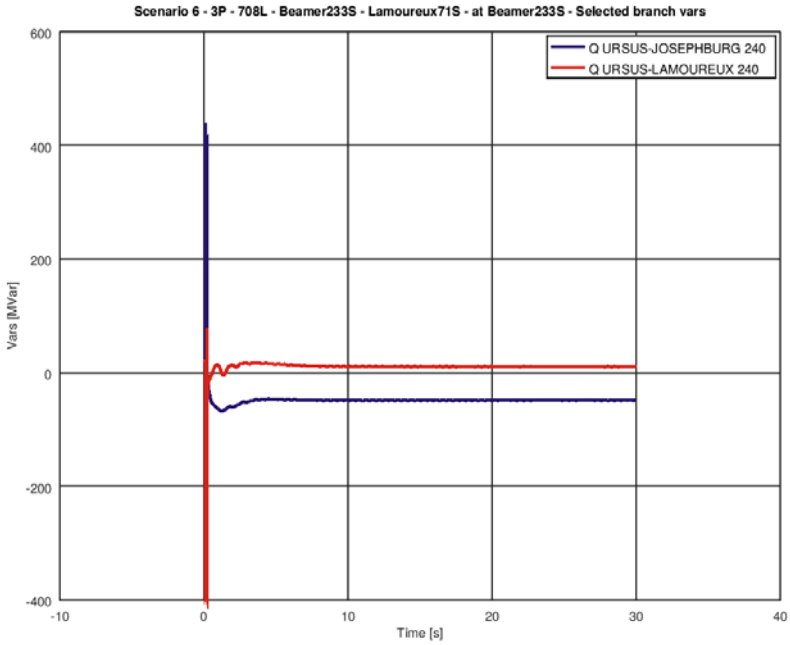


Figure A-485 Scenario 6 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

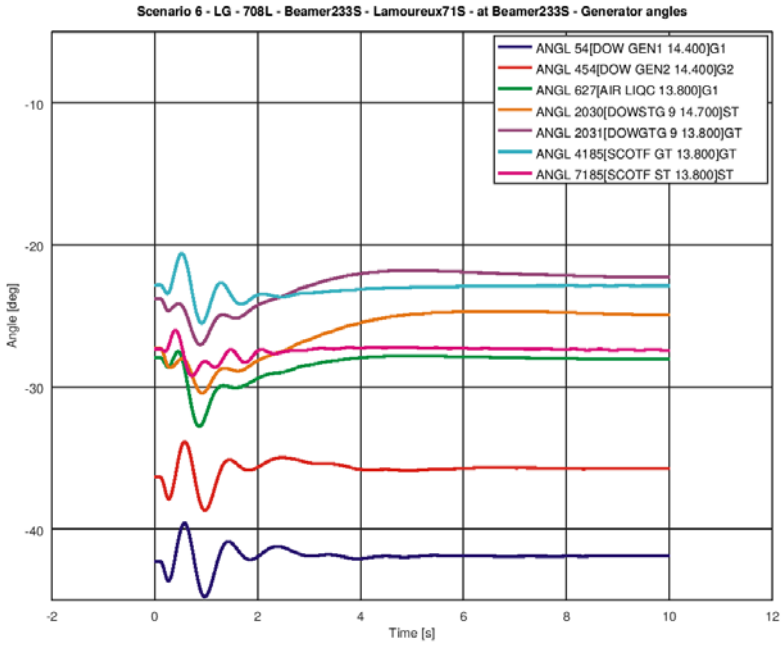


Figure A-486 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

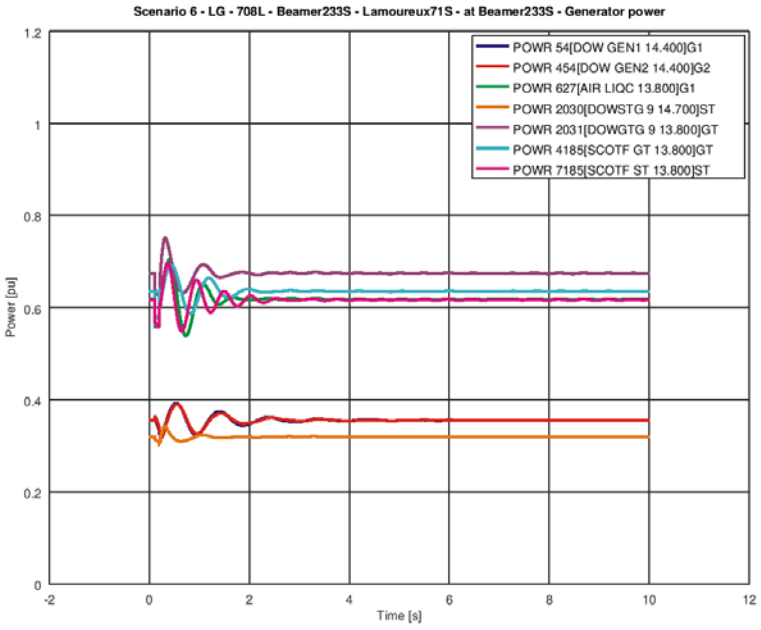


Figure A-487 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

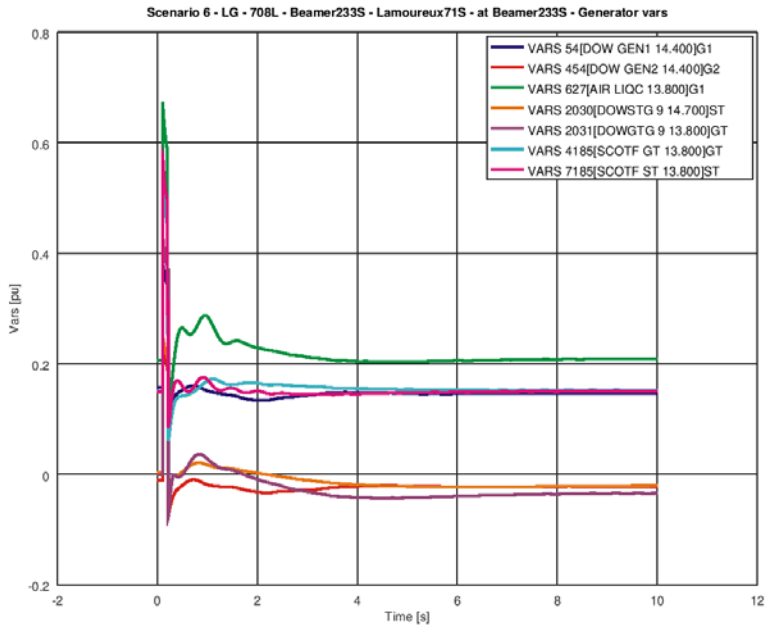


Figure A-488 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

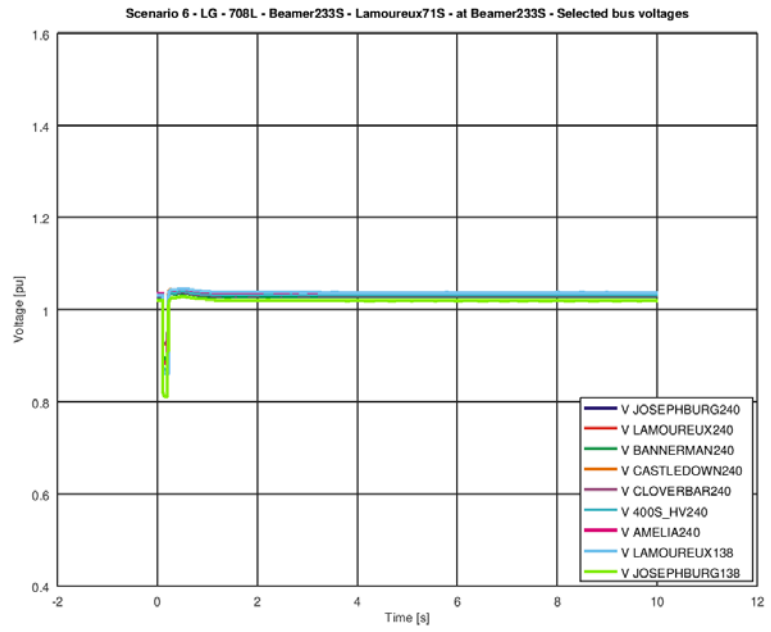


Figure A-489 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

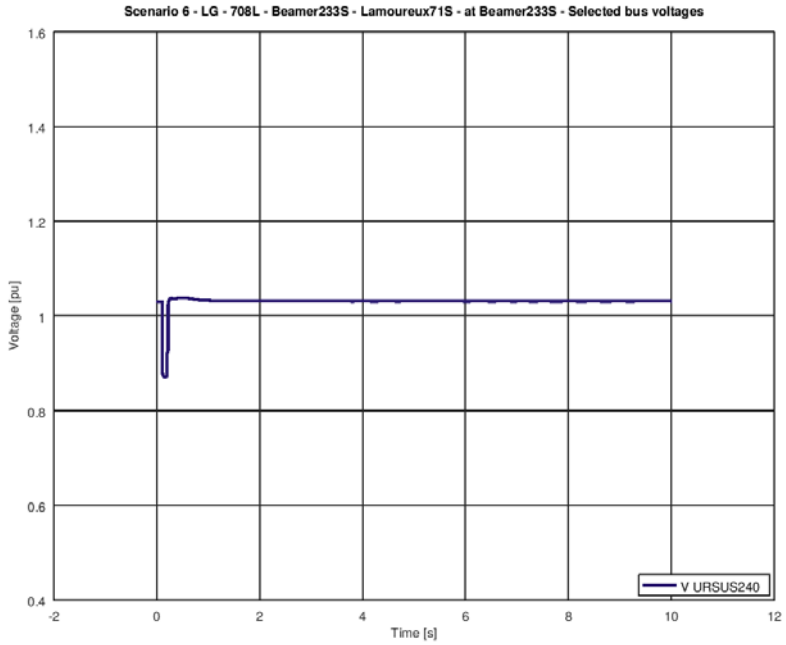


Figure A-490 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

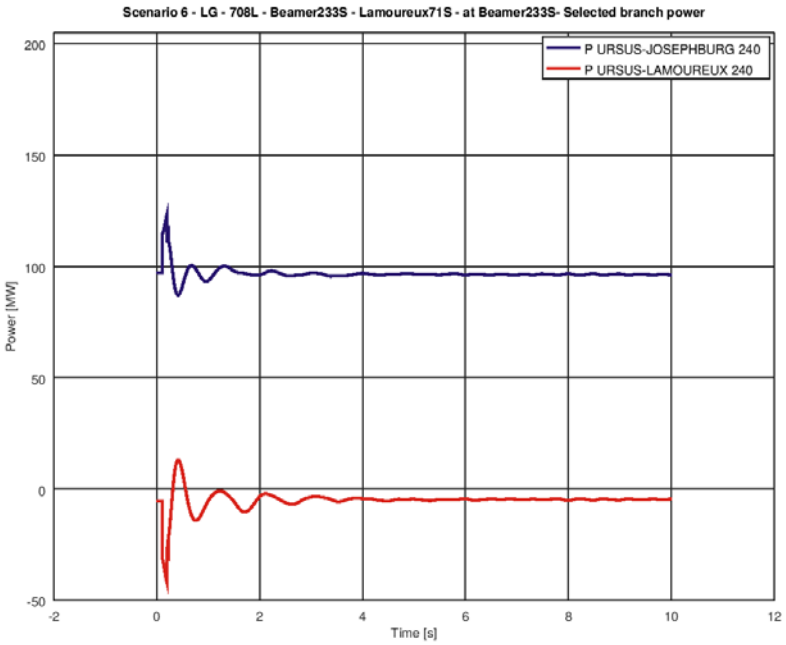


Figure A-491 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

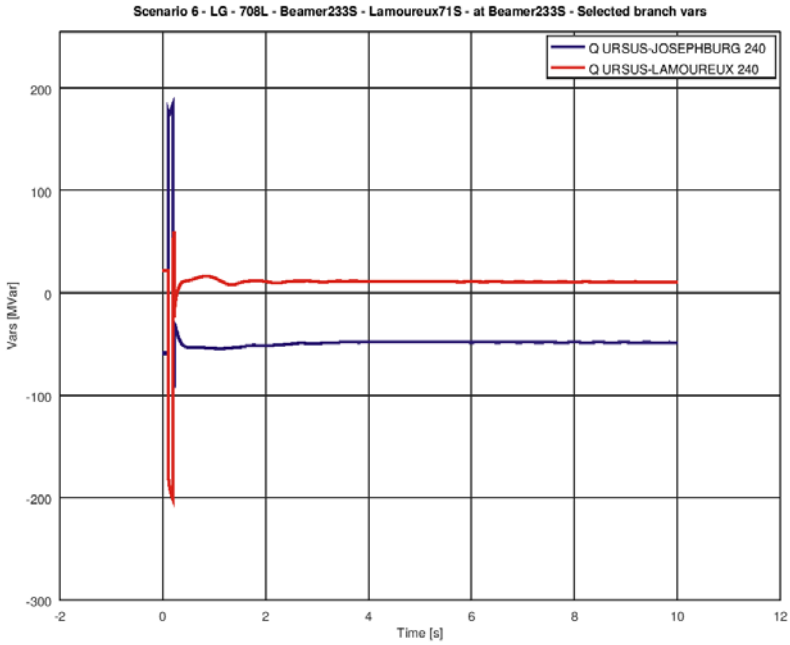


Figure A-492 Scenario 6 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

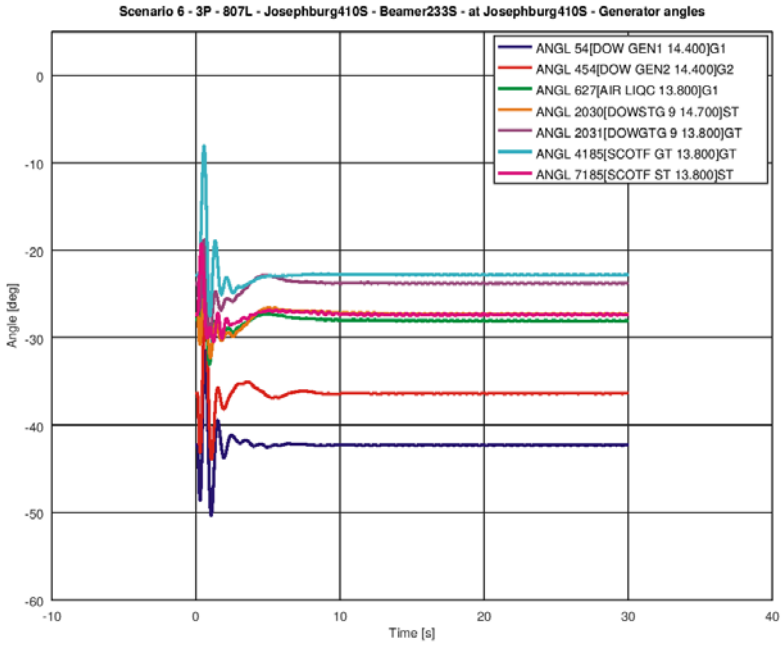


Figure A-493 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

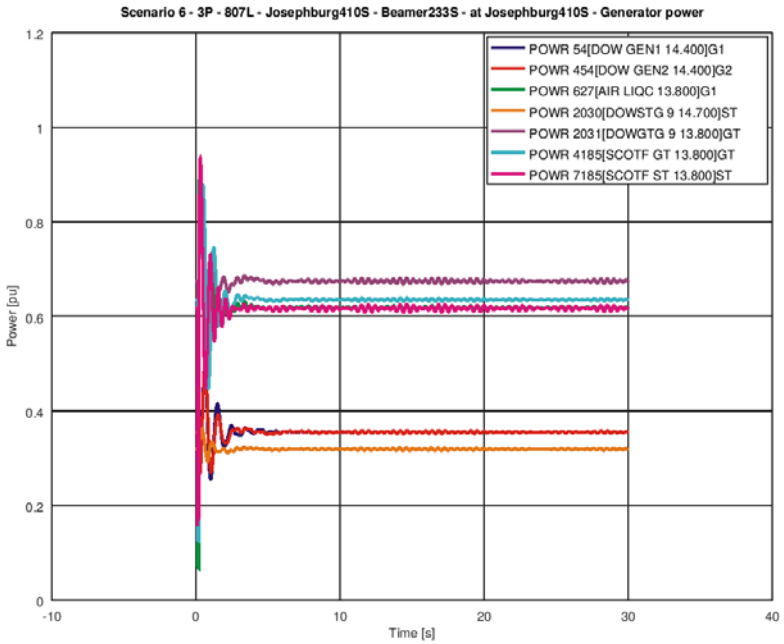


Figure A-494 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

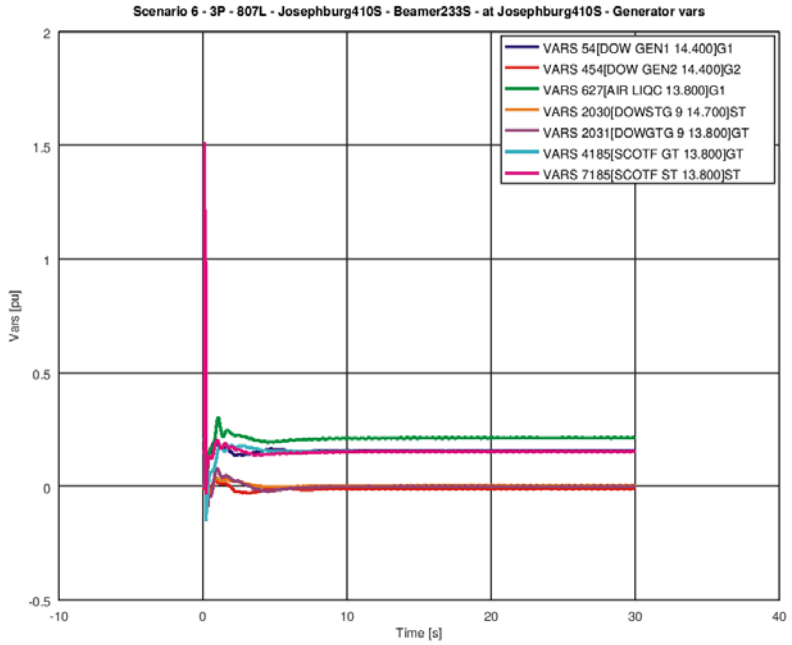


Figure A-495 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

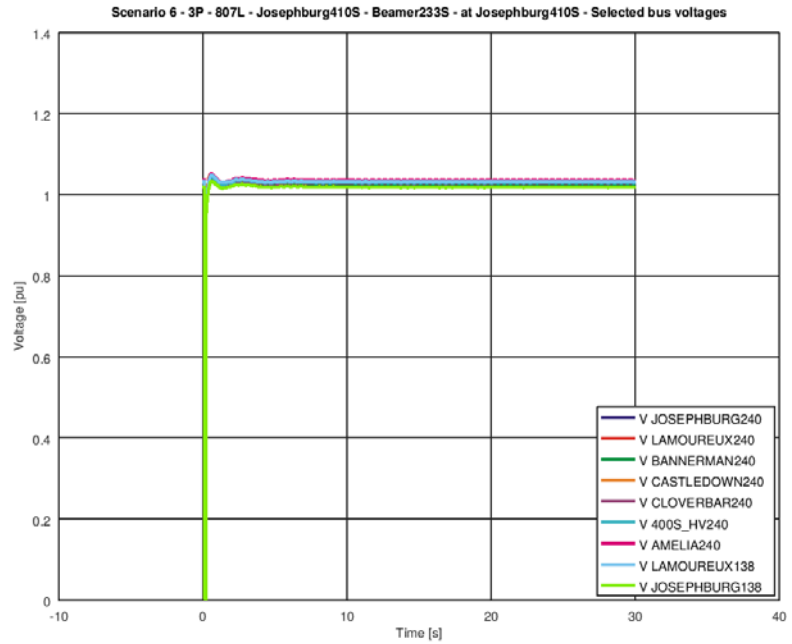


Figure A-496 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

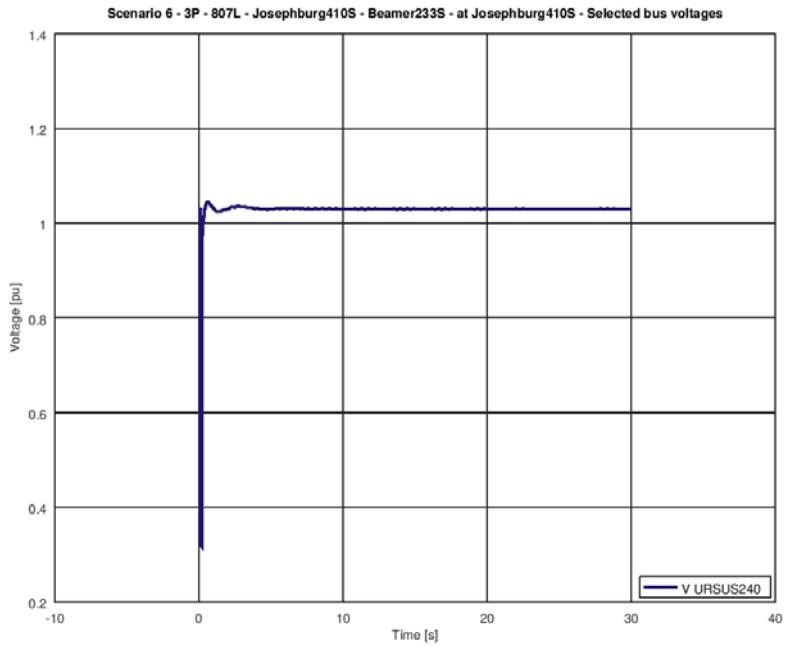


Figure A-497 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

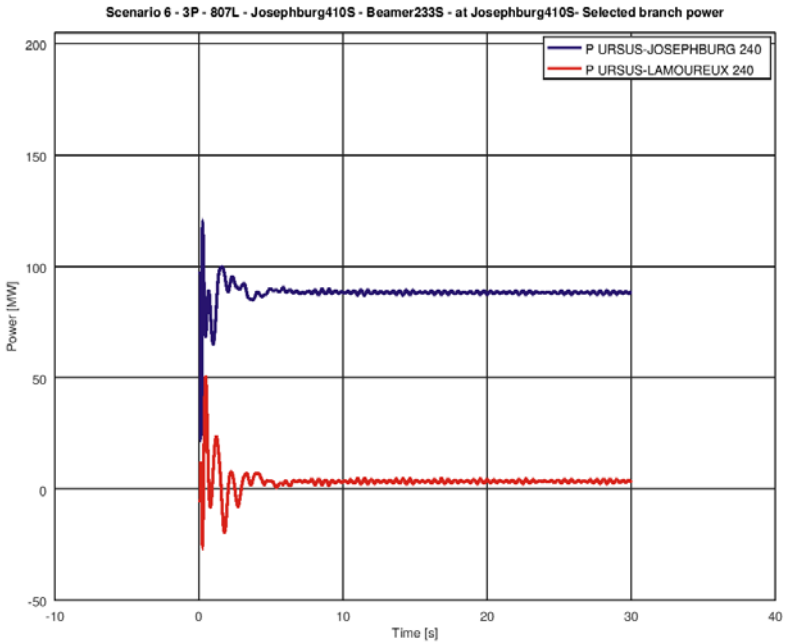


Figure A-498 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

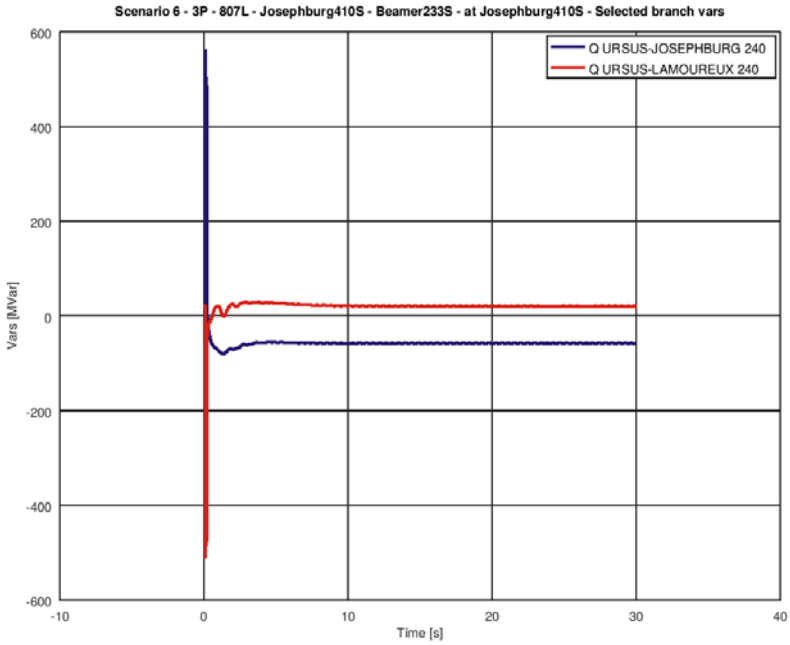


Figure A-499 Scenario 6 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

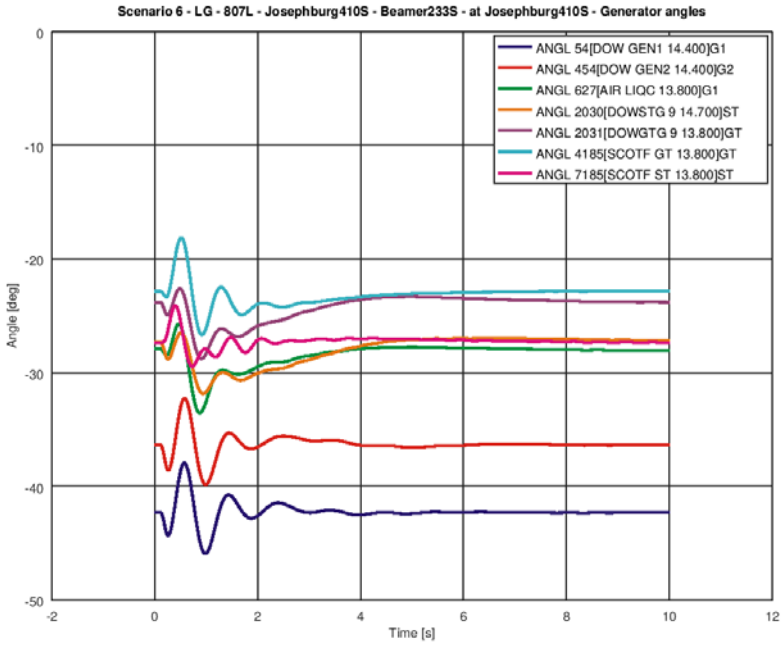


Figure A-500 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

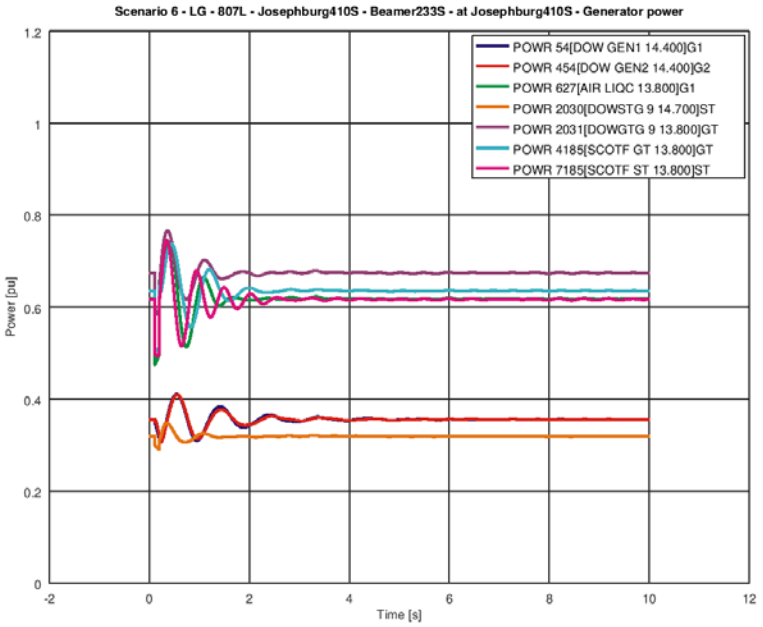


Figure A-501 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

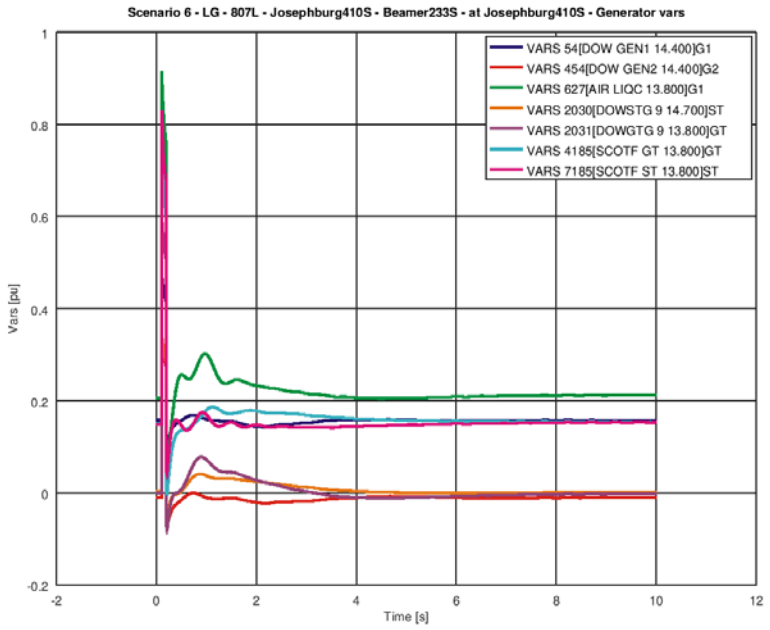


Figure A-502 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

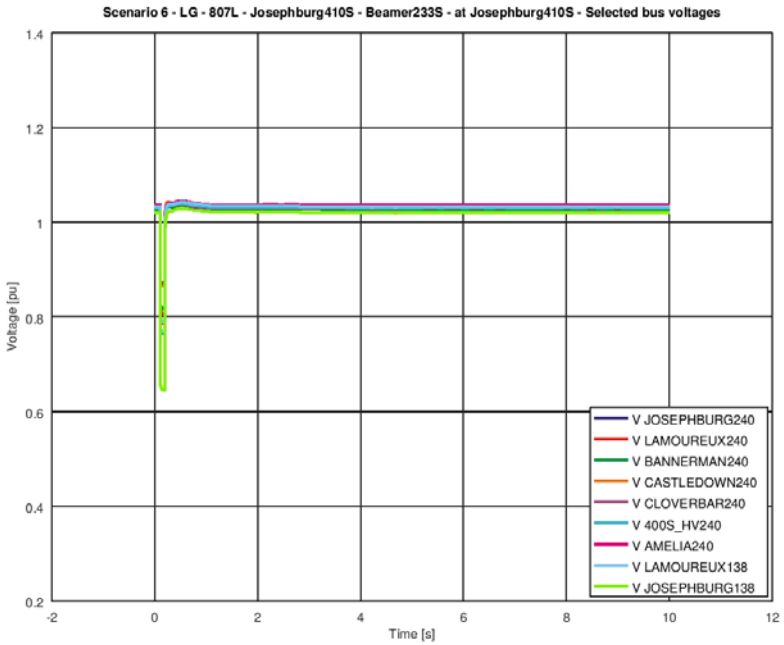


Figure A-503 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

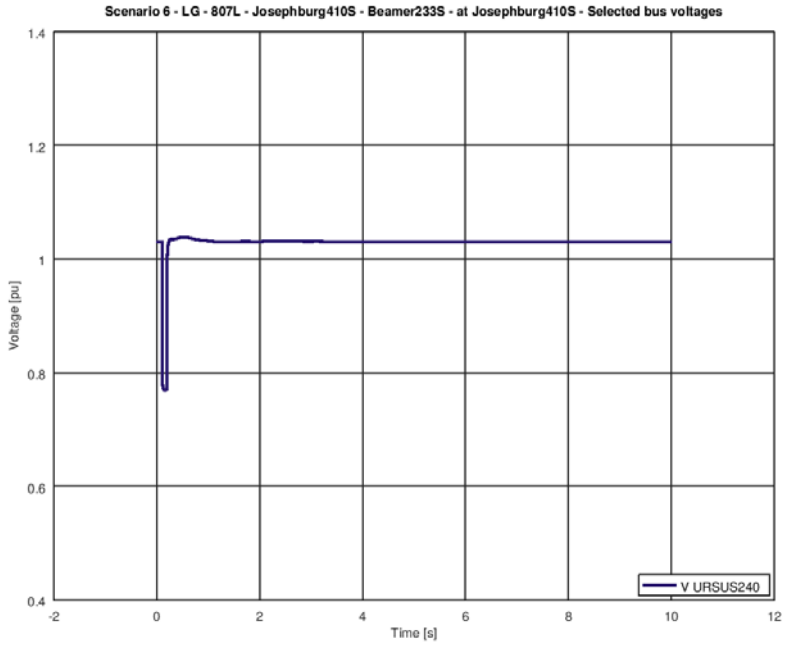


Figure A-504 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

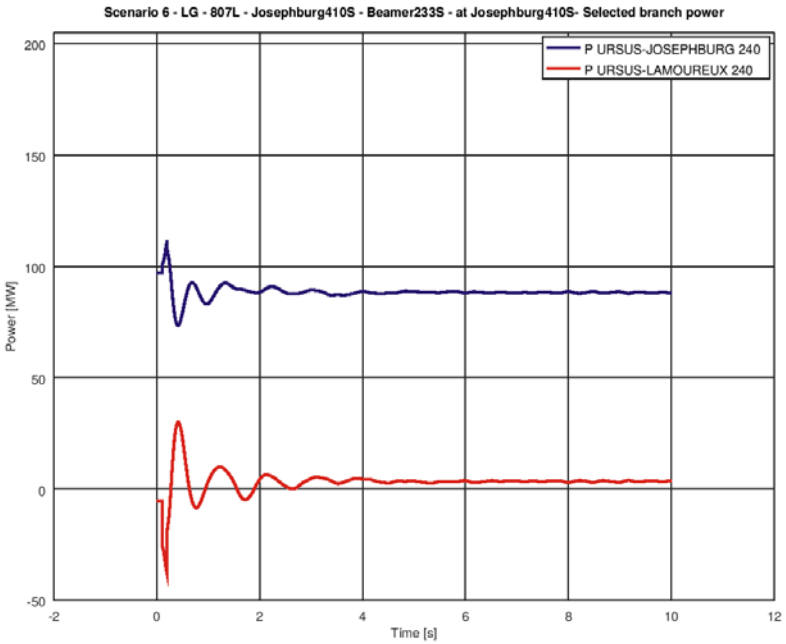


Figure A-505 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

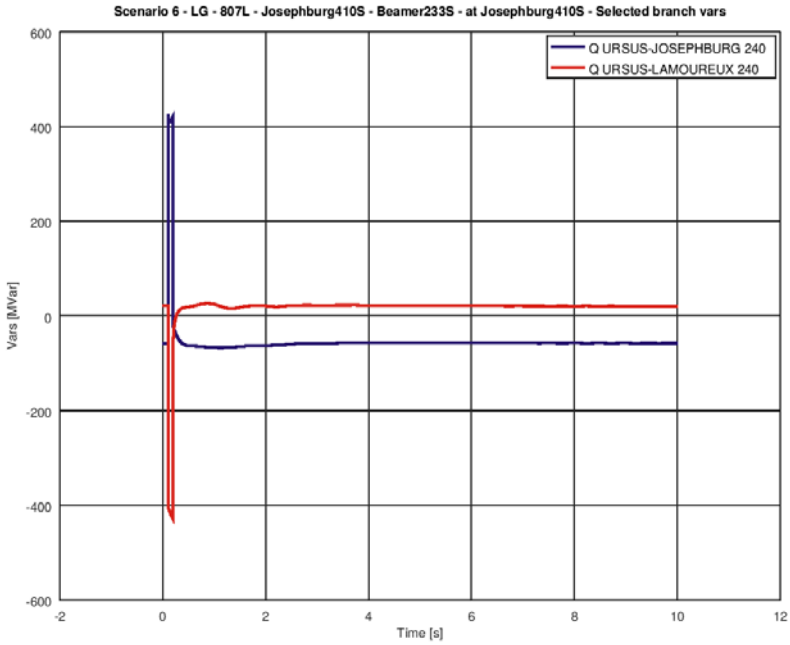


Figure A-506 Scenario 6 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

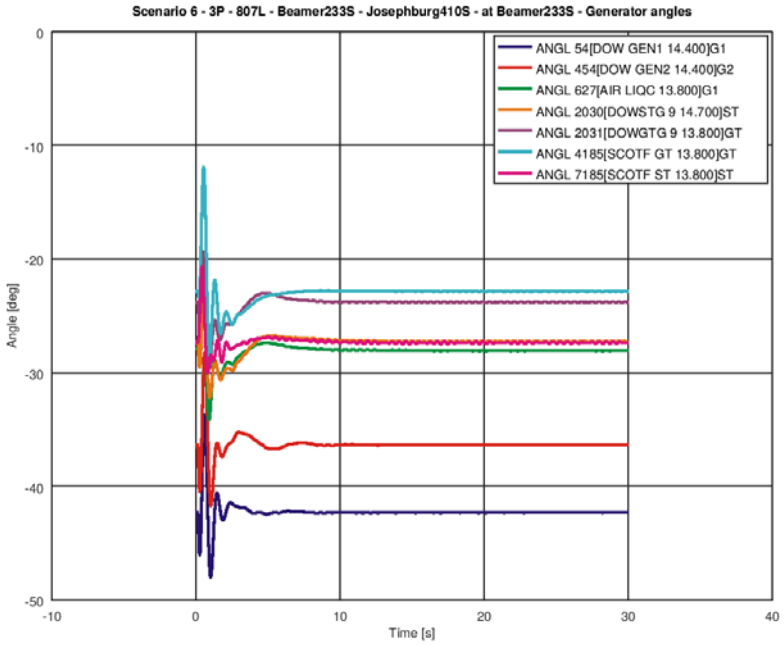


Figure A-507 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

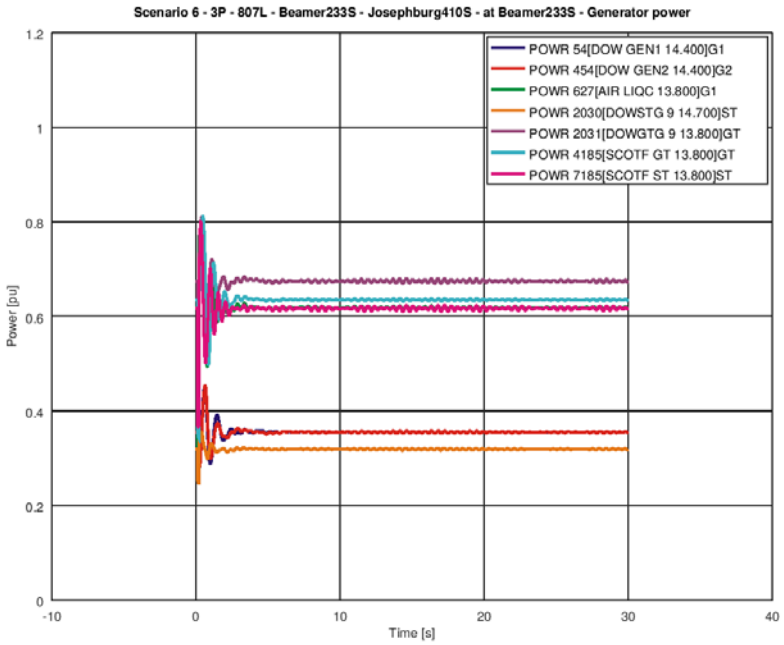


Figure A-508 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

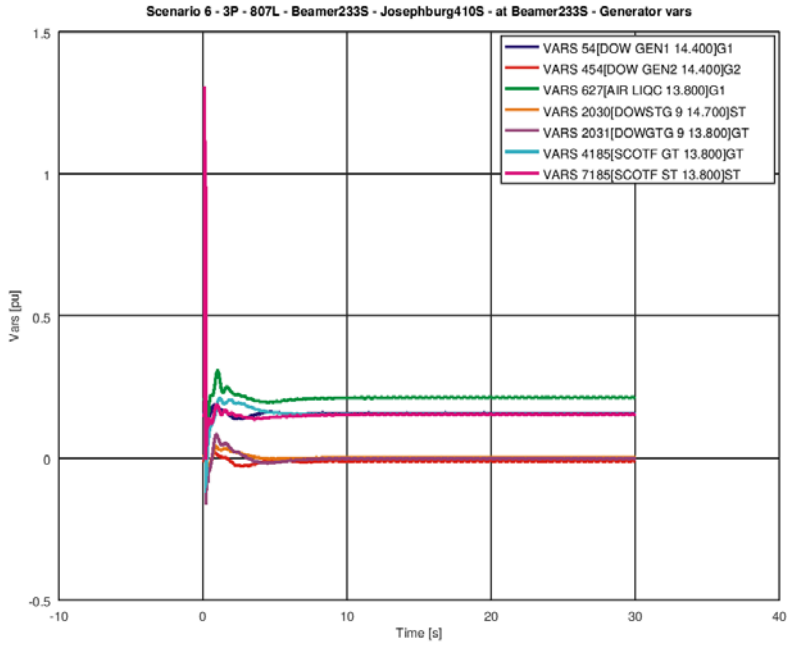


Figure A-509 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

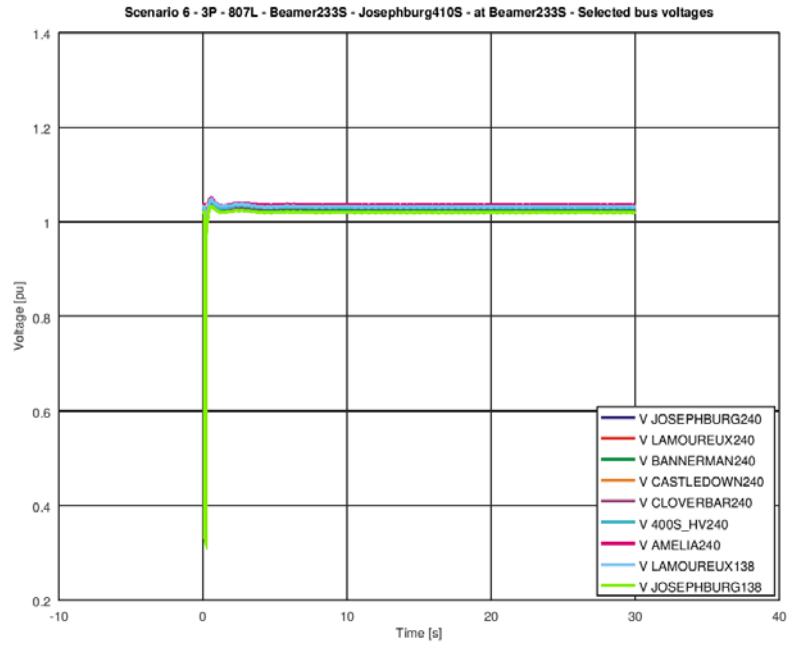


Figure A-510 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

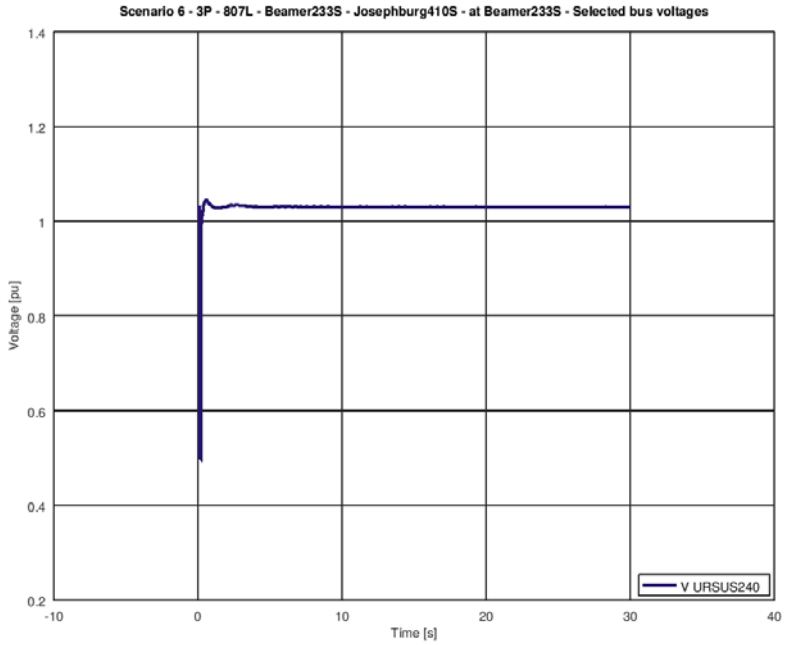


Figure A-511 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

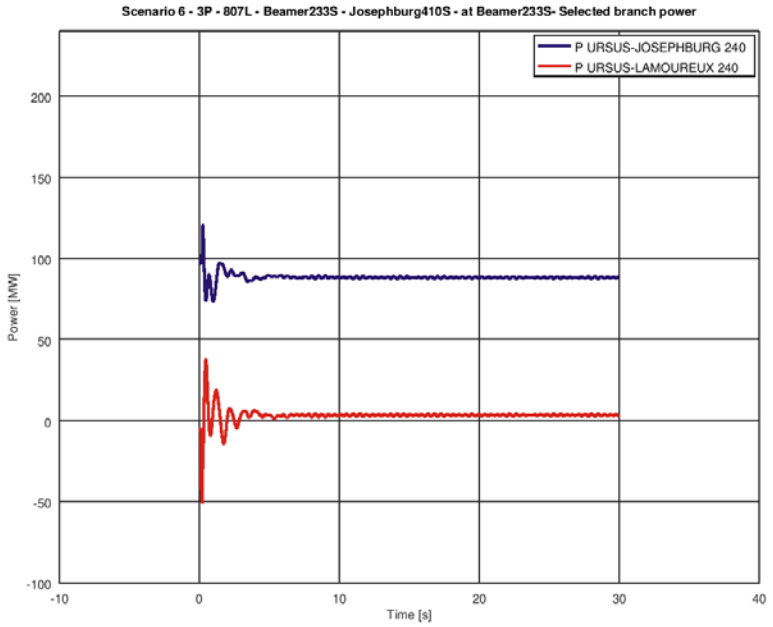


Figure A-512 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

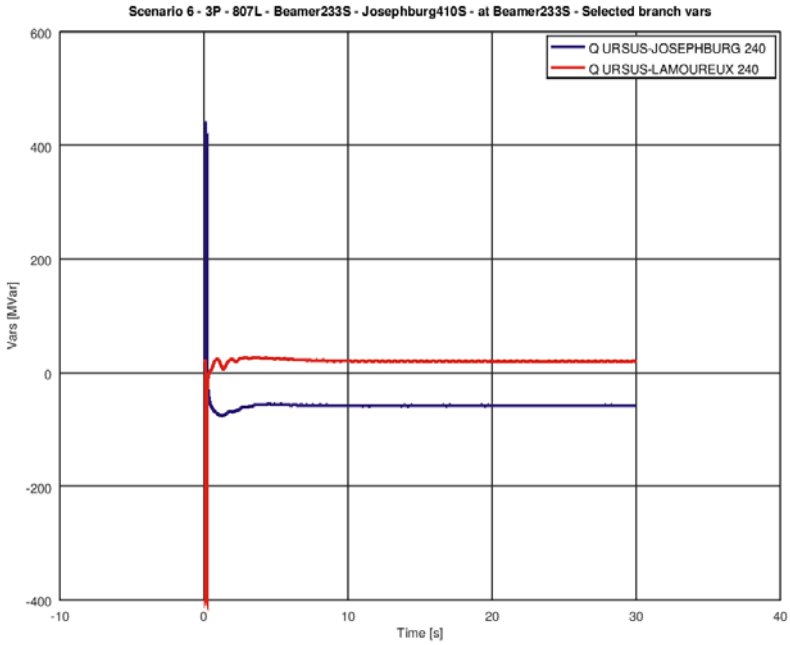


Figure A-513 Scenario 6 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

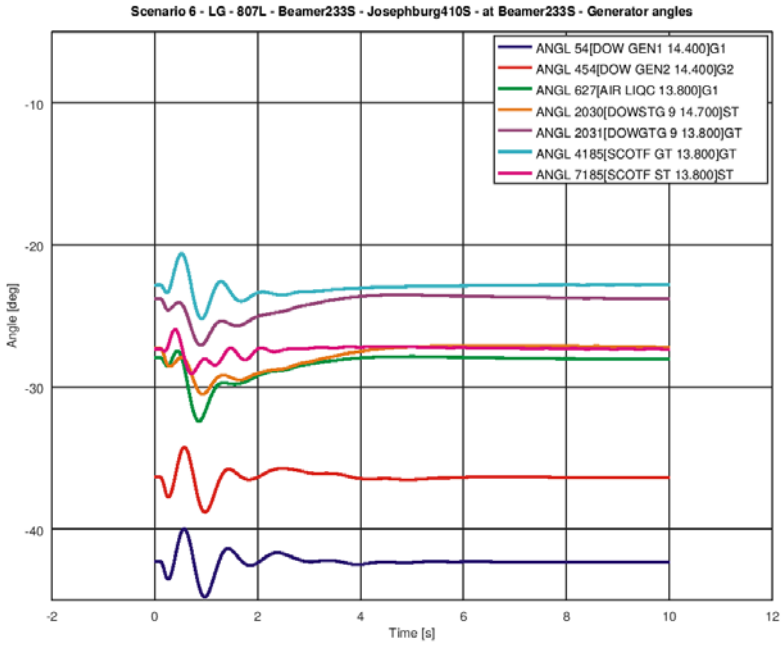


Figure A-514 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

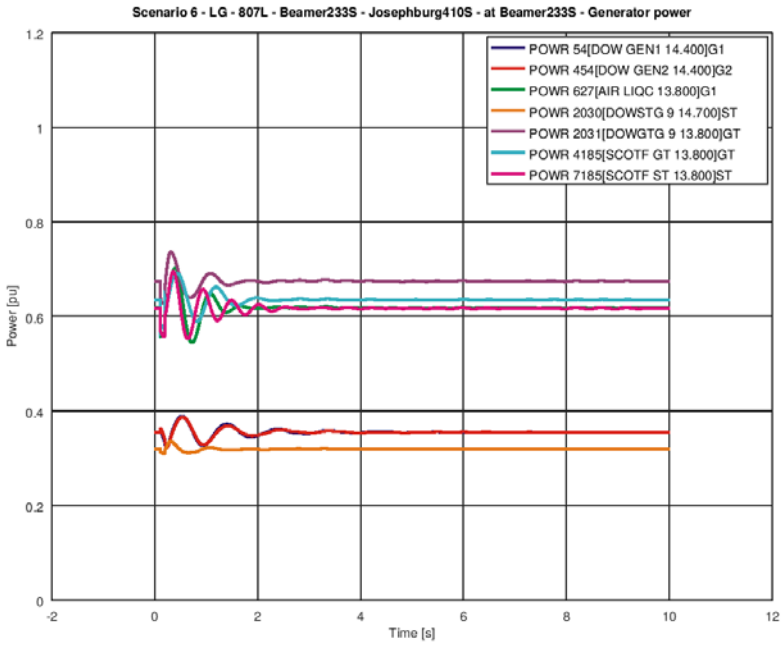


Figure A-515 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

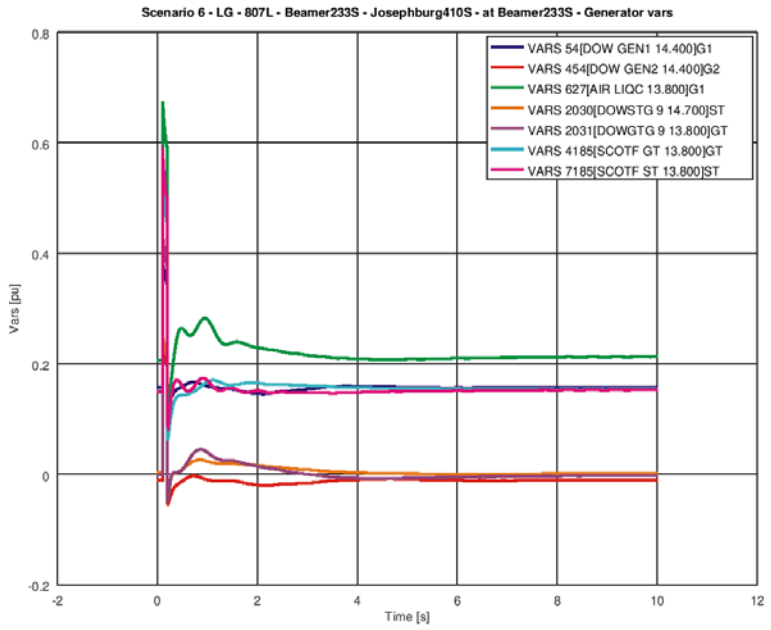


Figure A-516 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

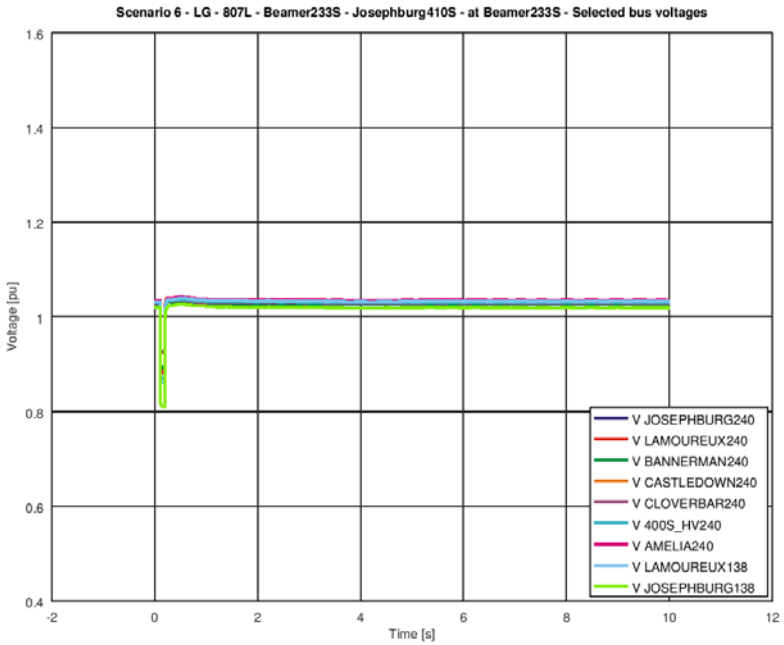


Figure A-517 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

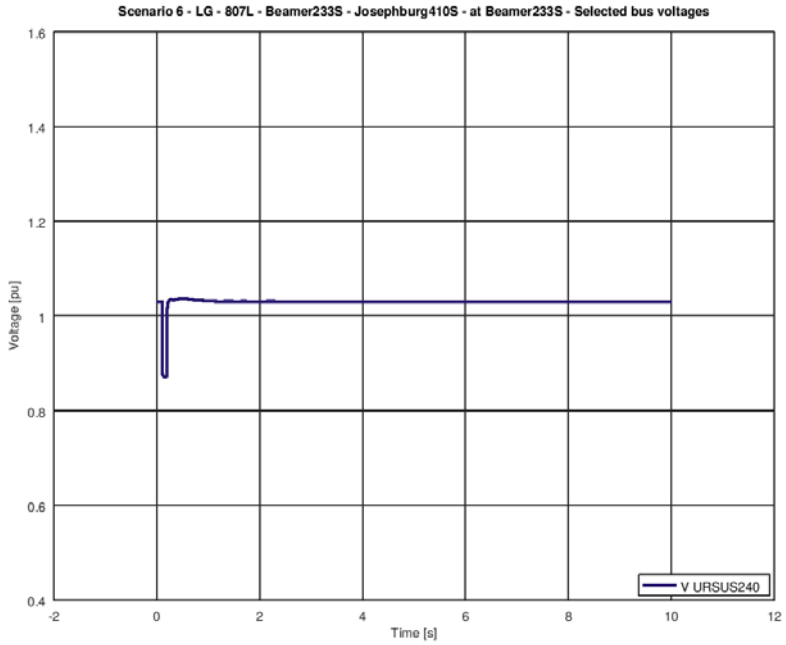


Figure A-518 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

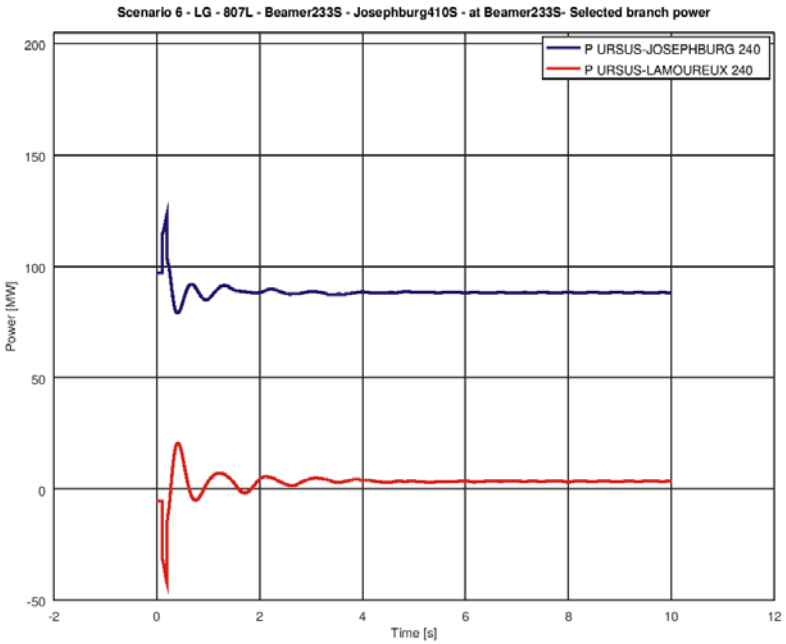


Figure A-519 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

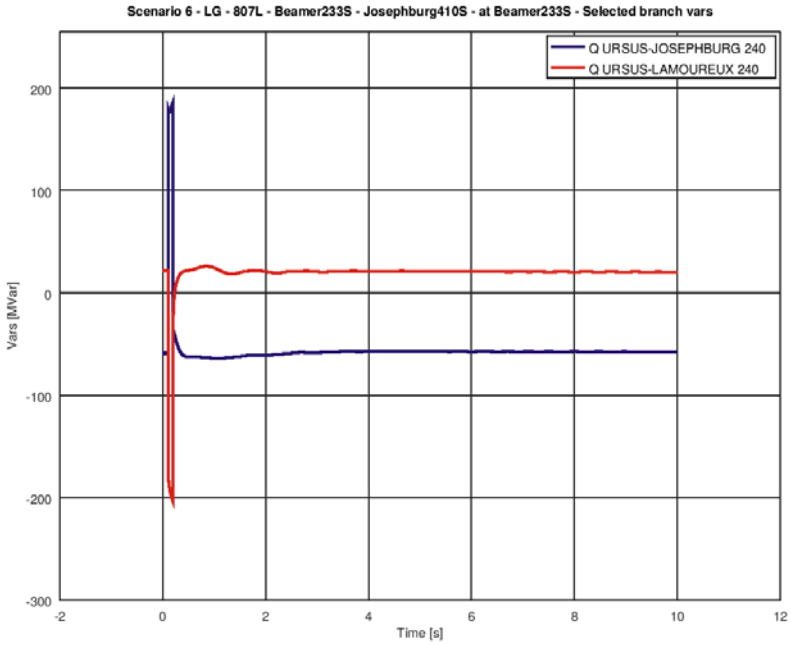


Figure A-520 Scenario 6 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

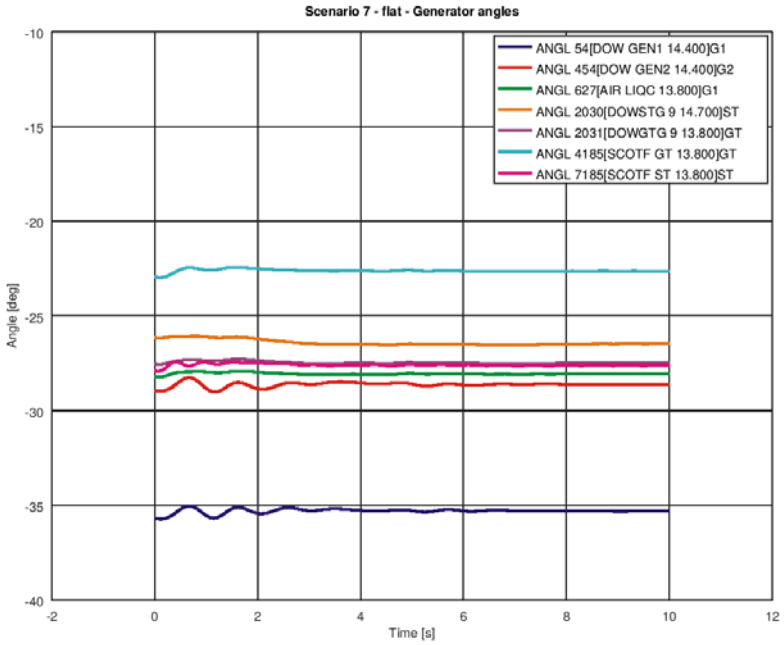


Figure A-521 Scenario 7 - flat - Generator angles

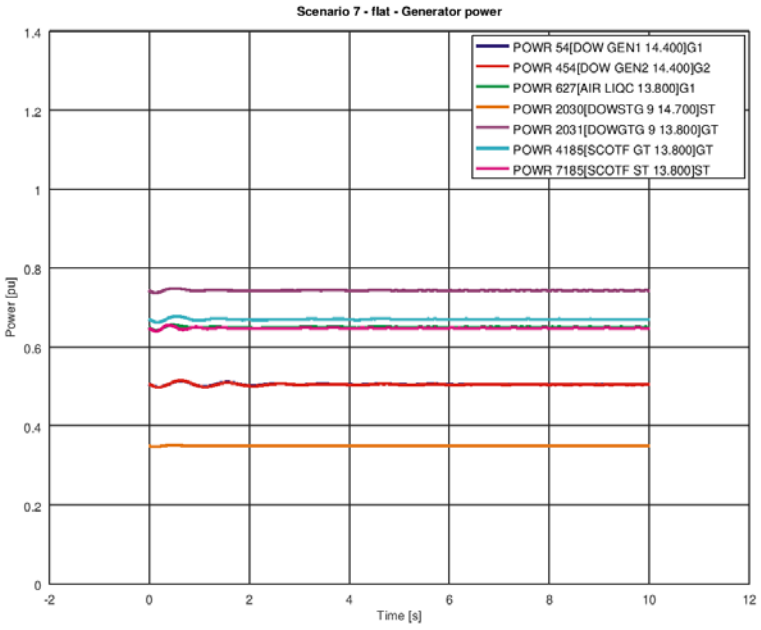


Figure A-522 Scenario 7 - flat - Generator power

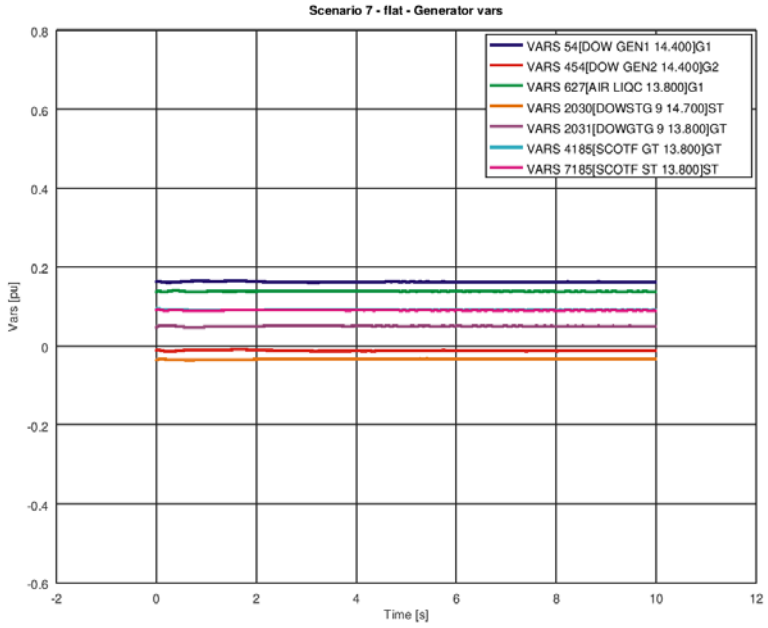


Figure A-523 Scenario 7 - flat - Generator vars

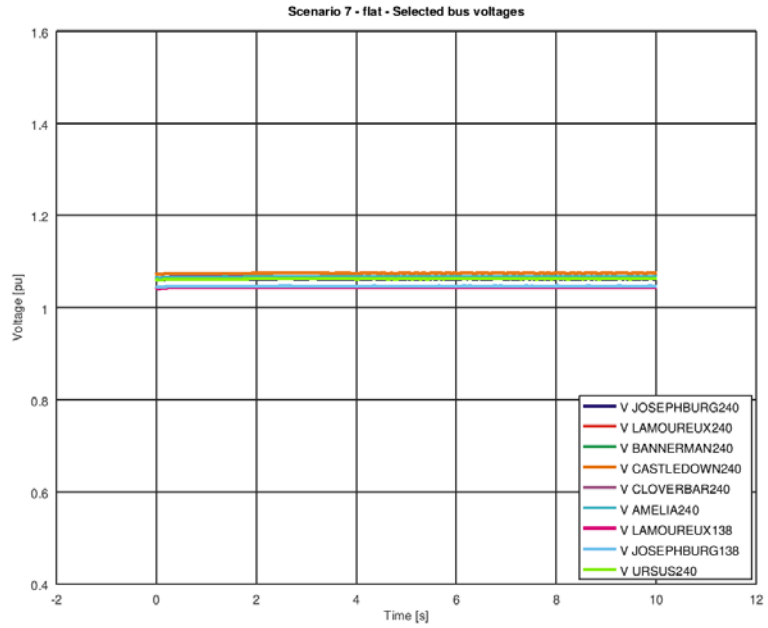


Figure A-524 Scenario 7 - flat - Selected bus voltages

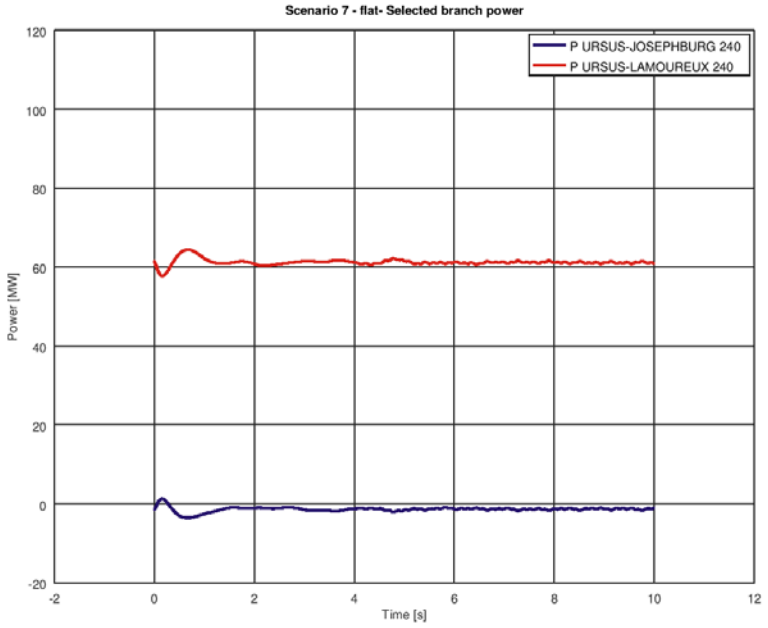


Figure A-525 Scenario 7 - flat - Selected branch power

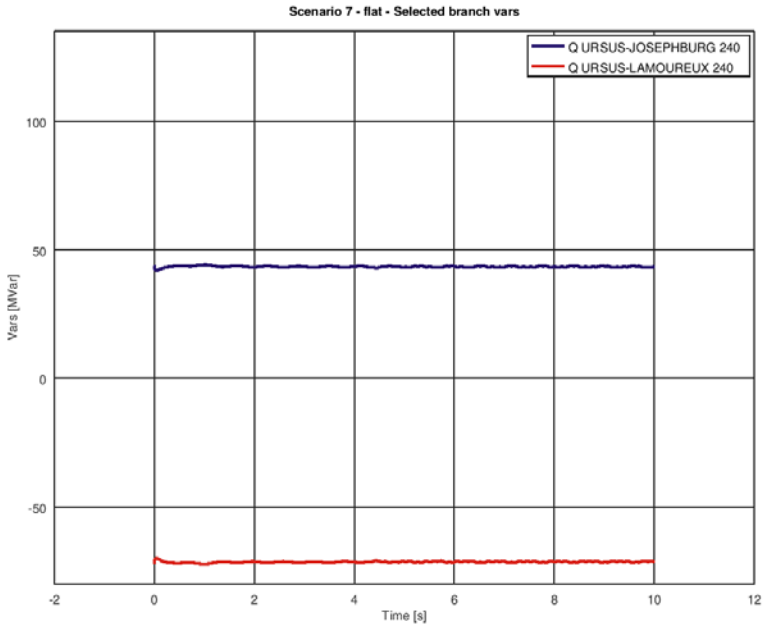


Figure A-526 Scenario 7 - flat - Selected branch vars

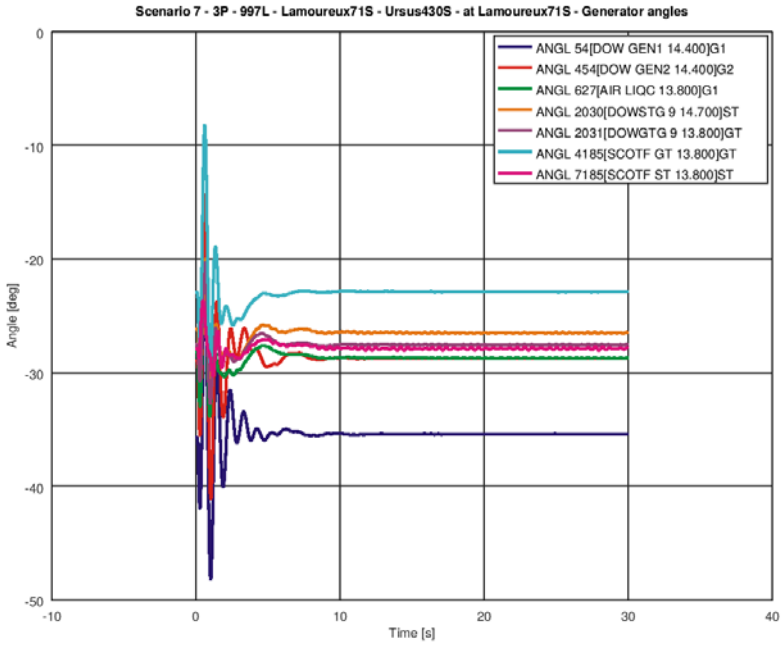


Figure A-527 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

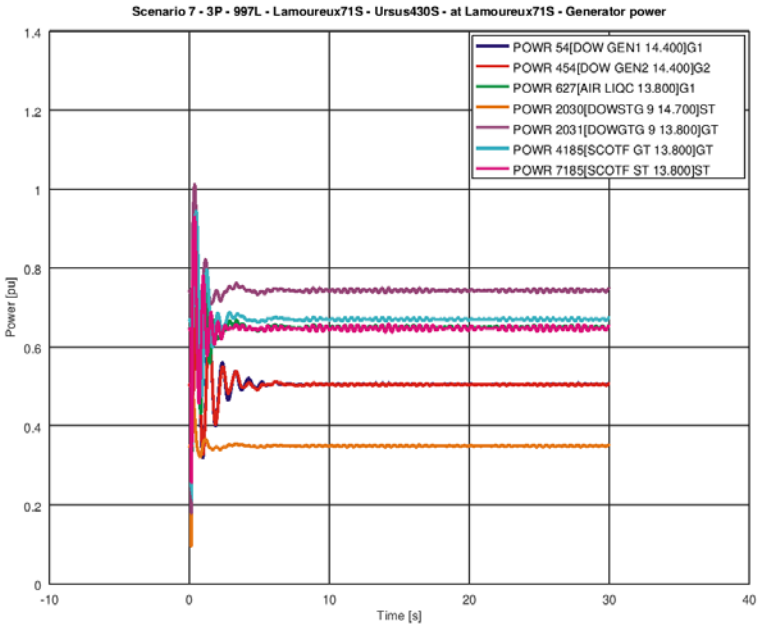


Figure A-528 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

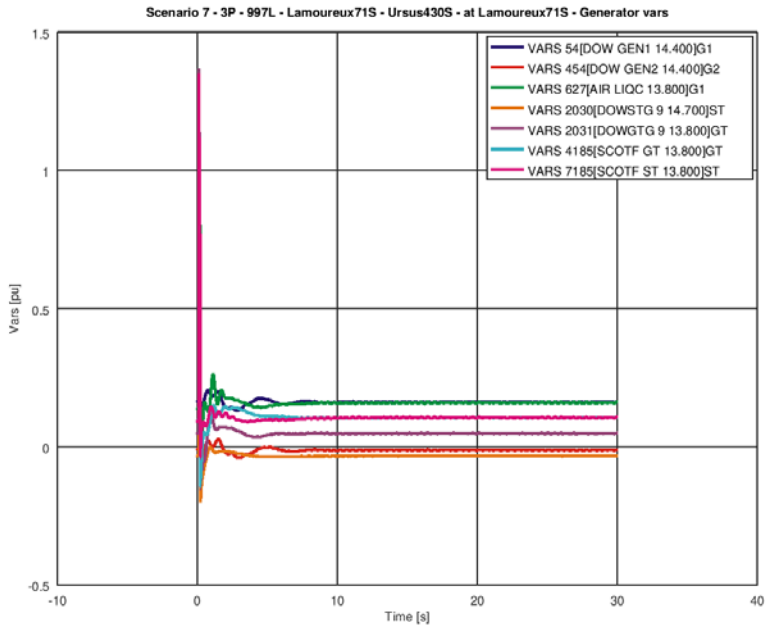


Figure A-529 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

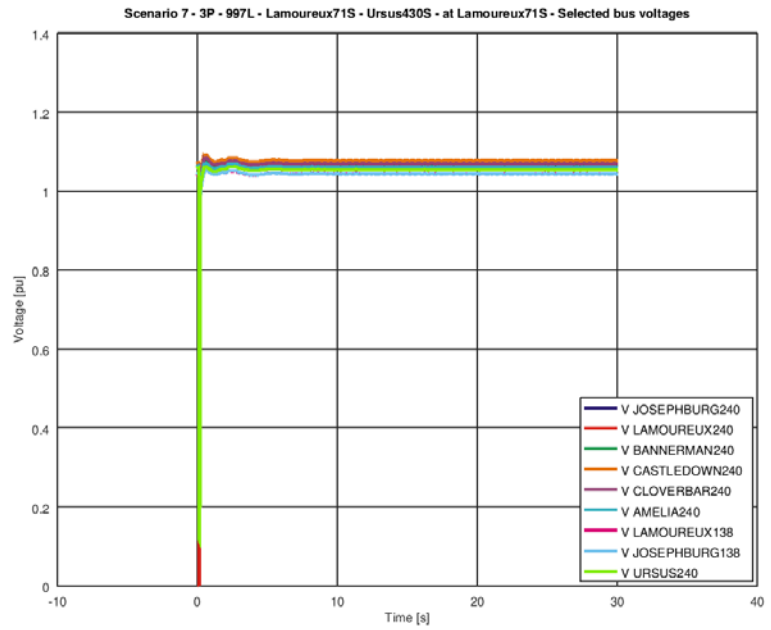


Figure A-530 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

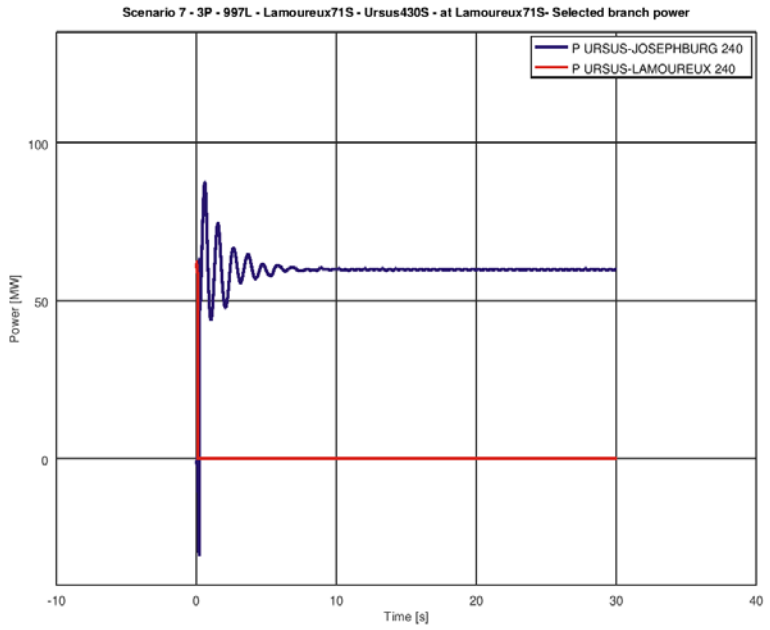


Figure A-531 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

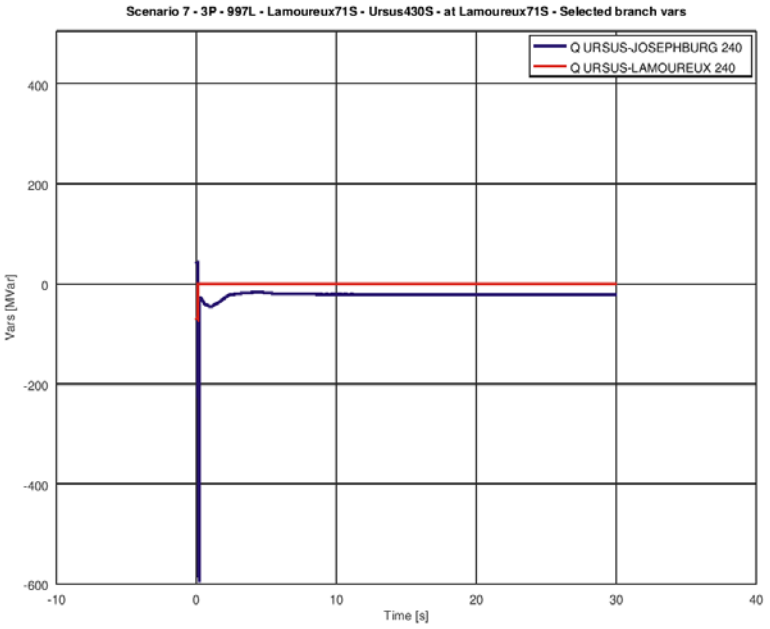


Figure A-532 Scenario 7 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

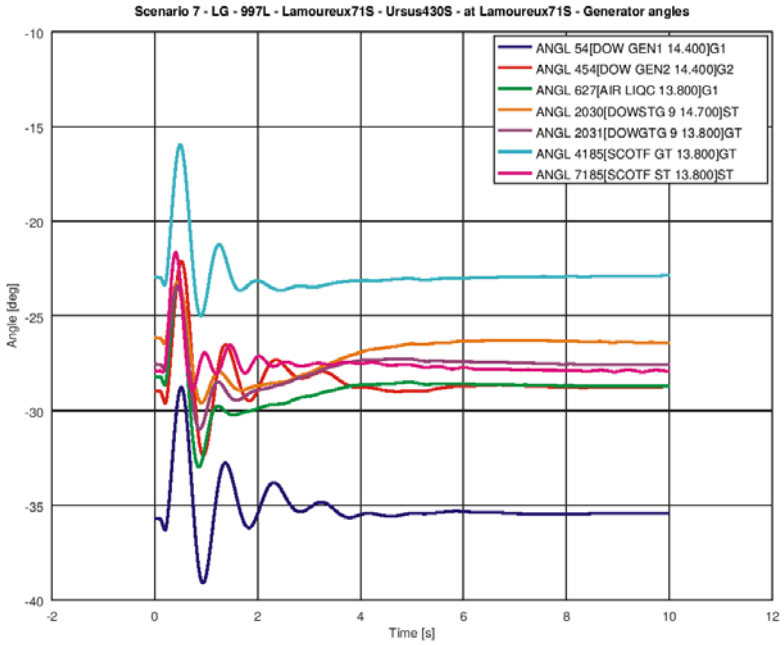


Figure A-533 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

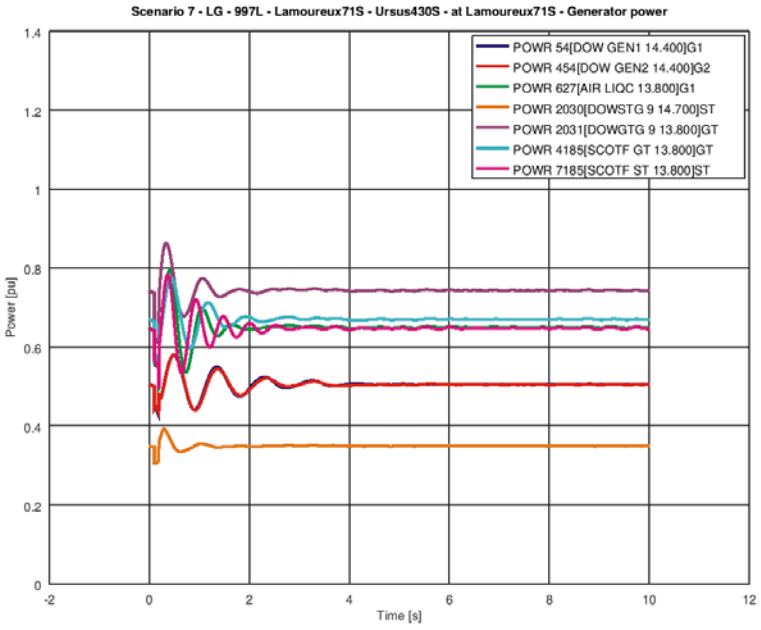


Figure A-534 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

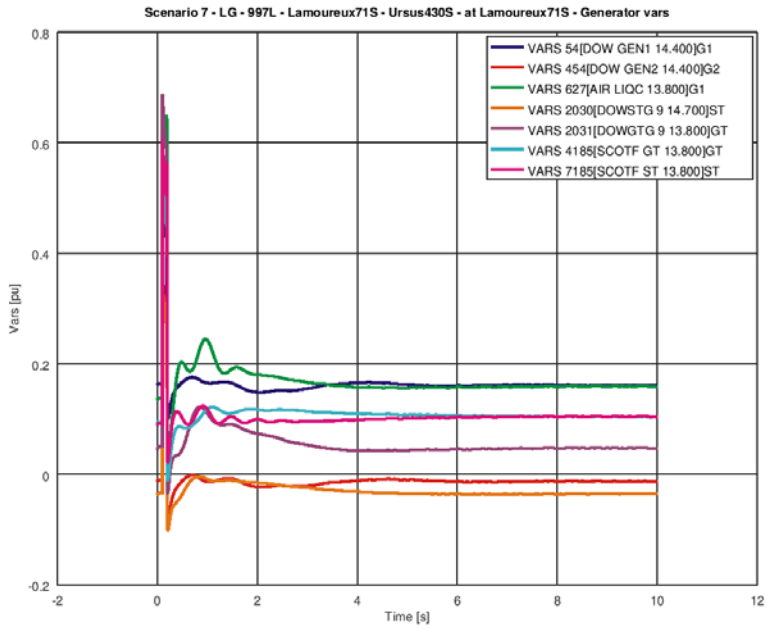


Figure A-535 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

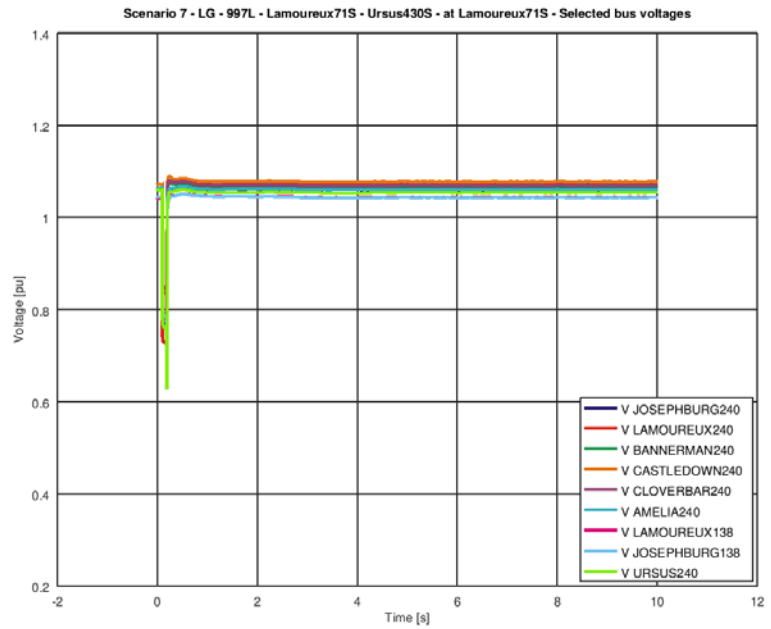


Figure A-536 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

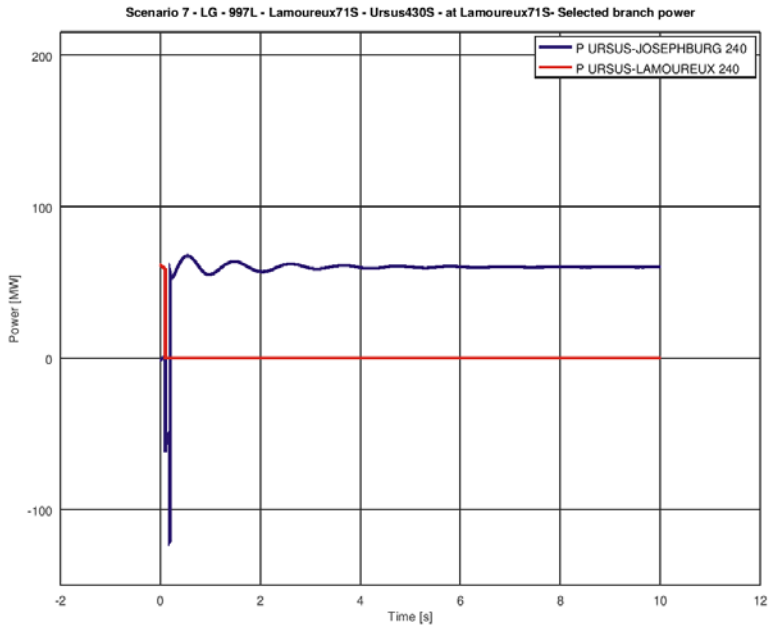


Figure A-537 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

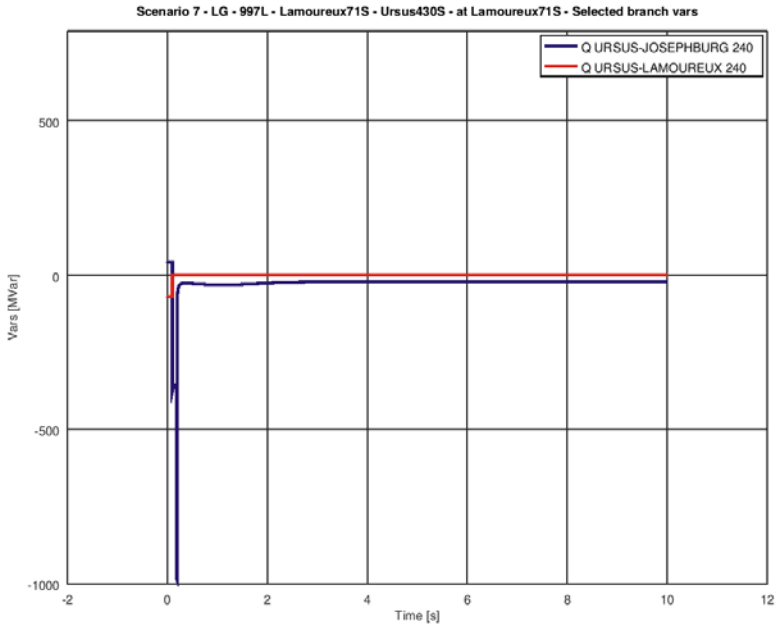


Figure A-538 Scenario 7 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

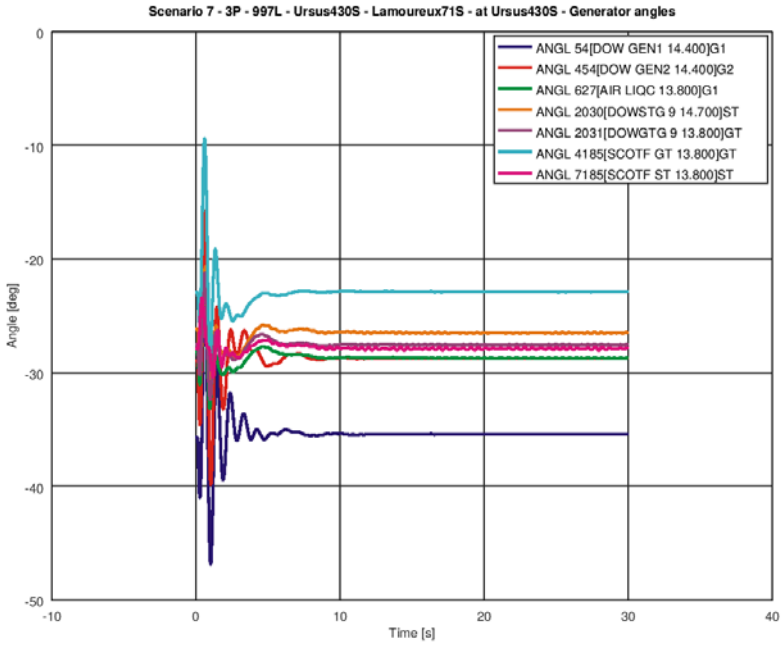


Figure A-539 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

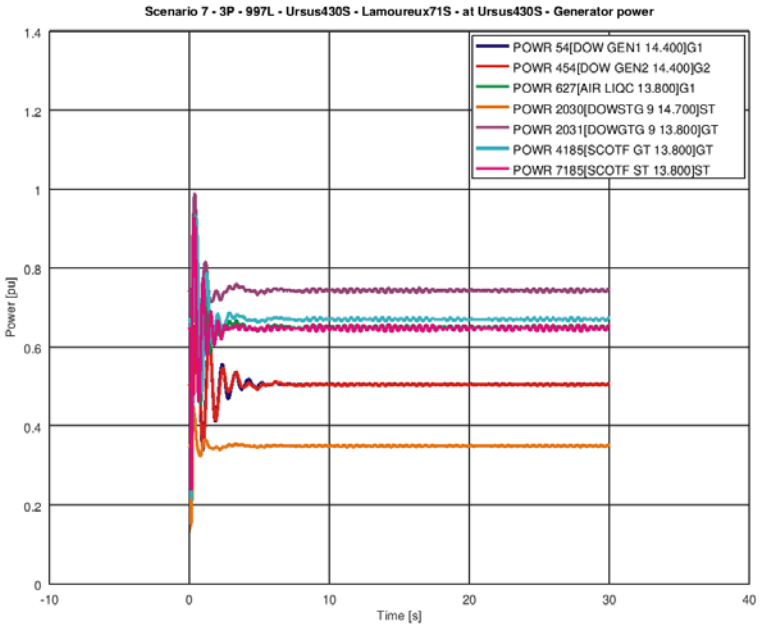


Figure A-540 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

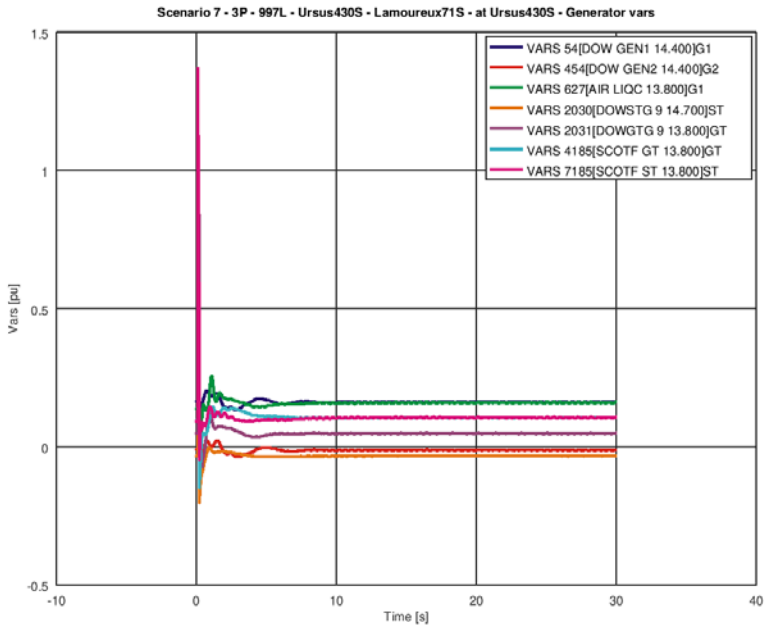


Figure A-541 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

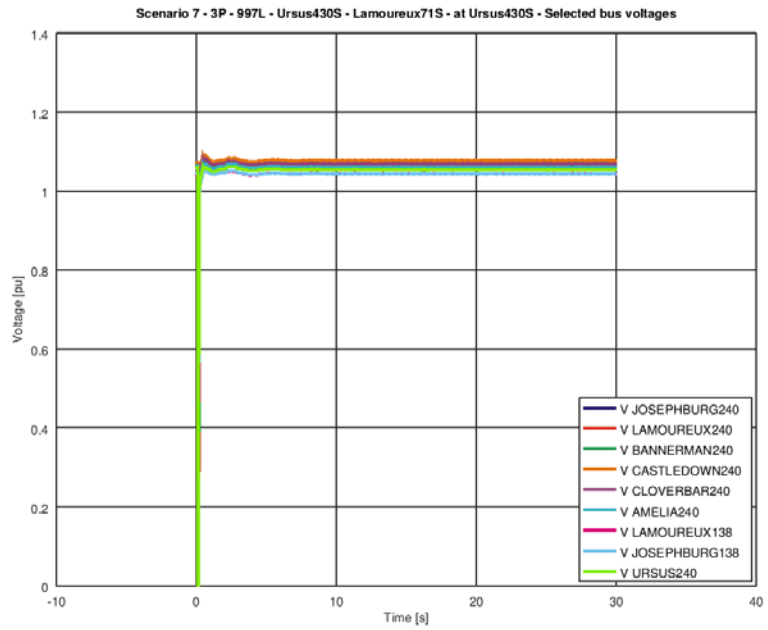


Figure A-542 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

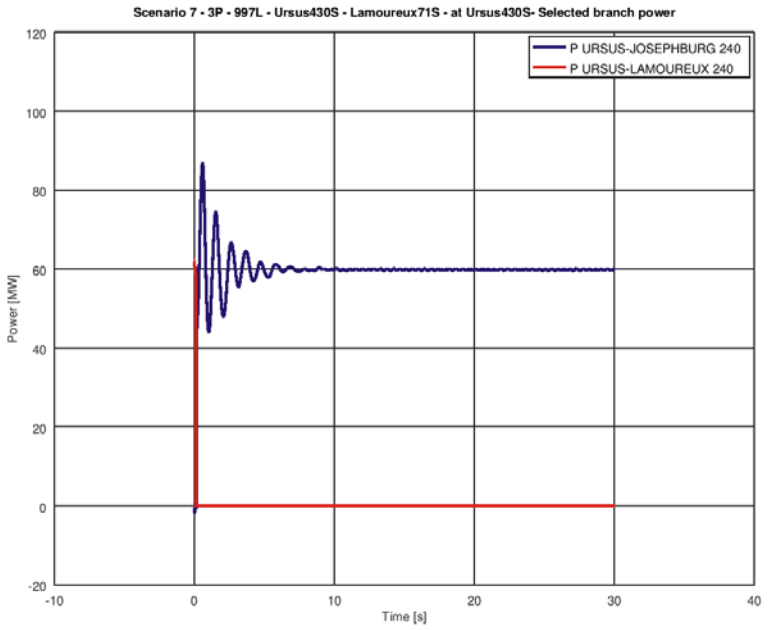


Figure A-543 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

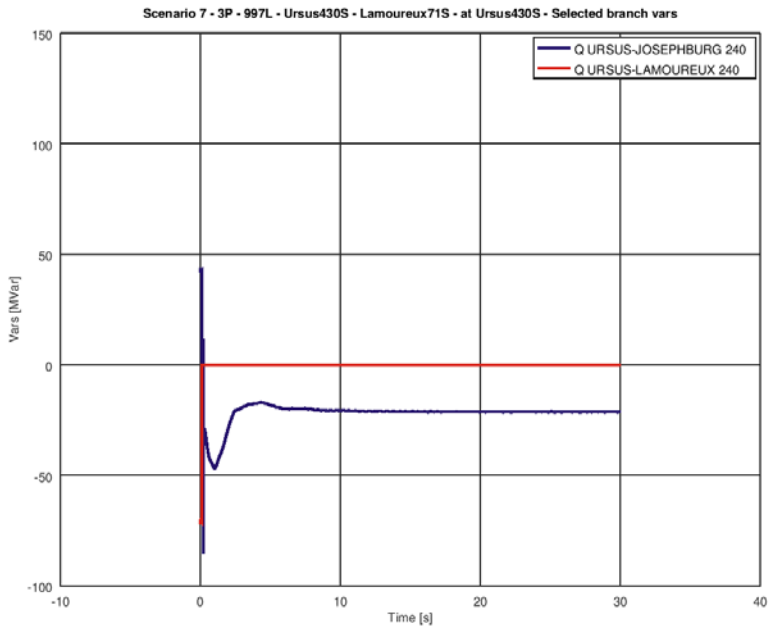


Figure A-544 Scenario 7 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

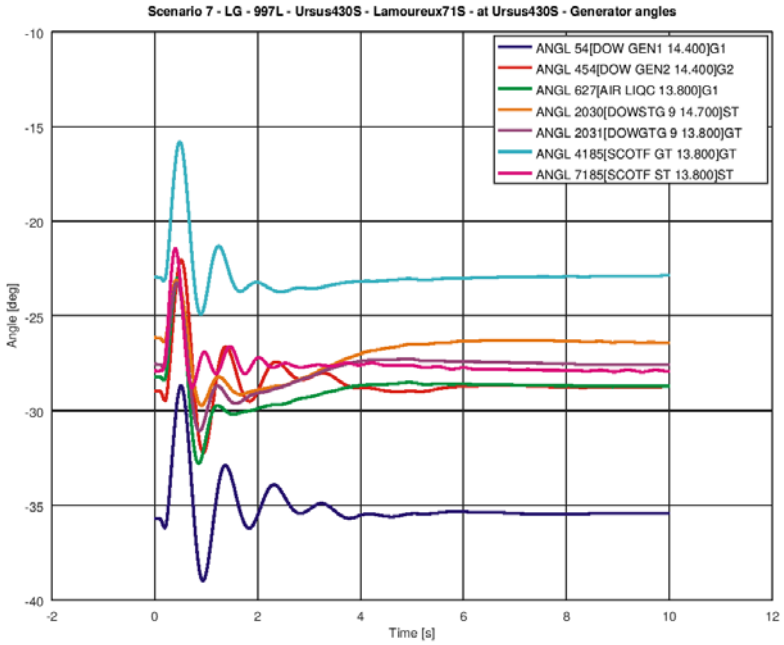


Figure A-545 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

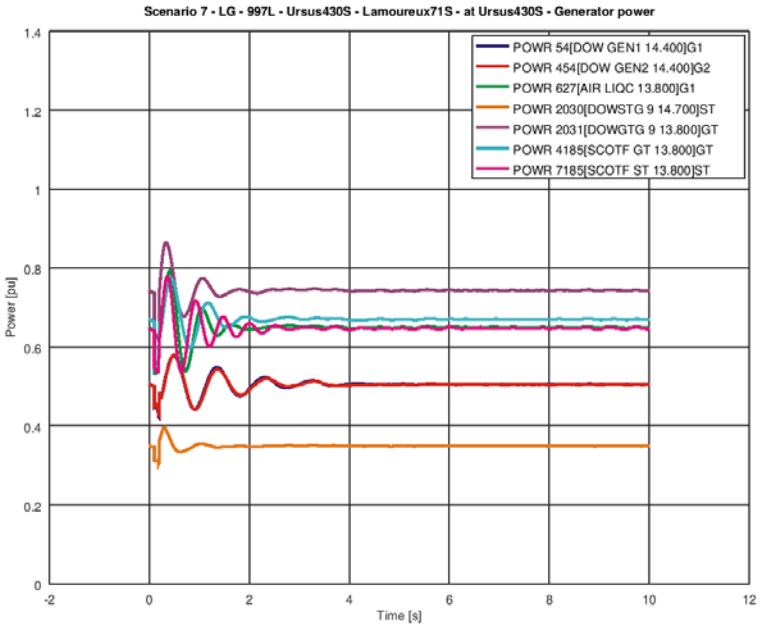


Figure A-546 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

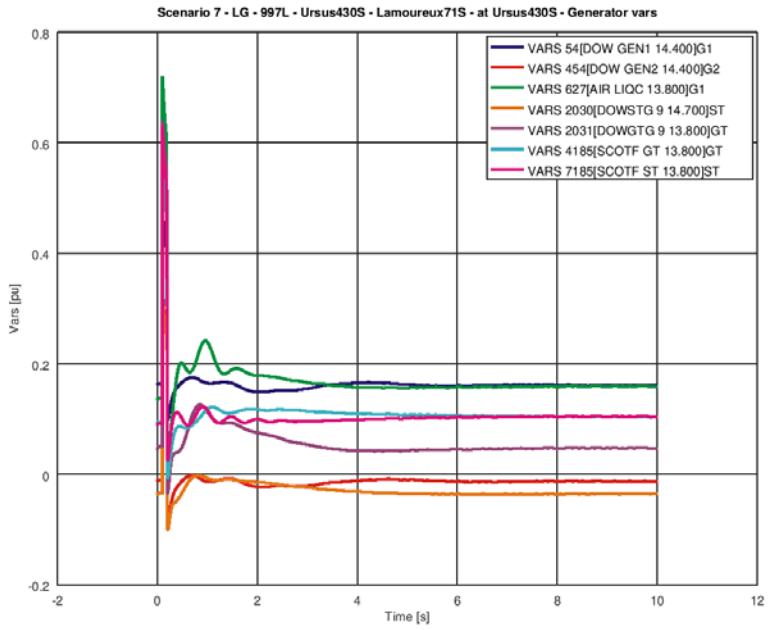


Figure A-547 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

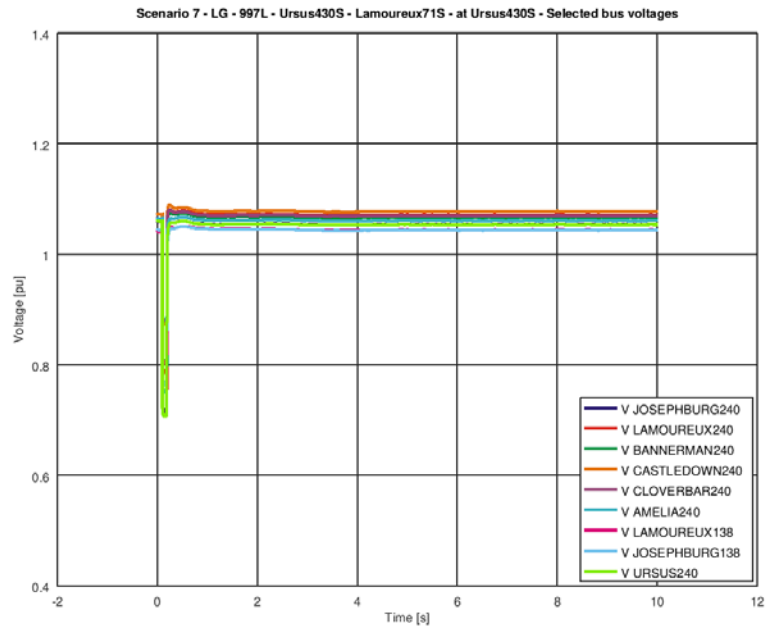


Figure A-548 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

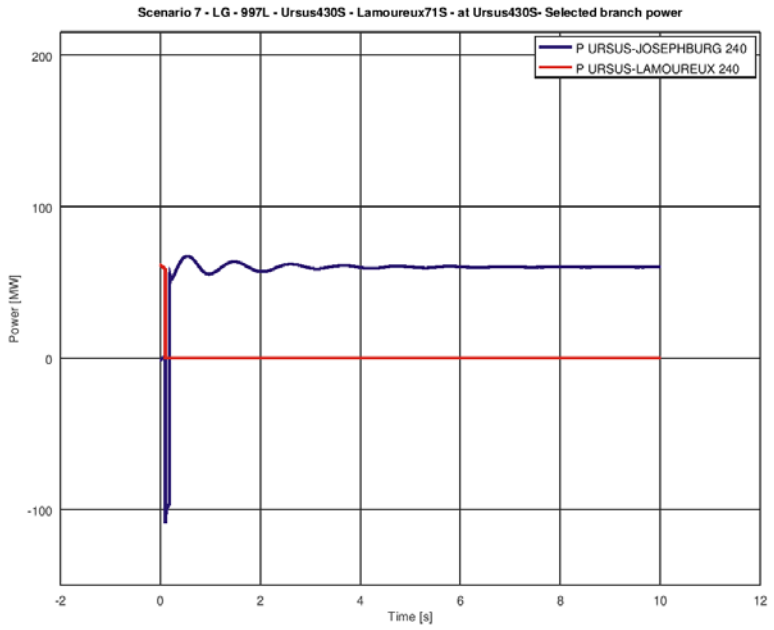


Figure A-549 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

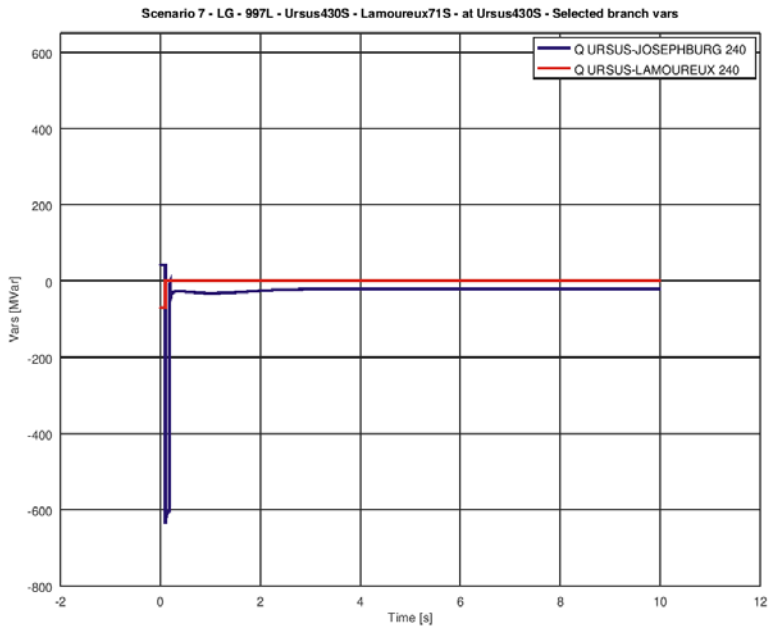


Figure A-550 Scenario 7 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

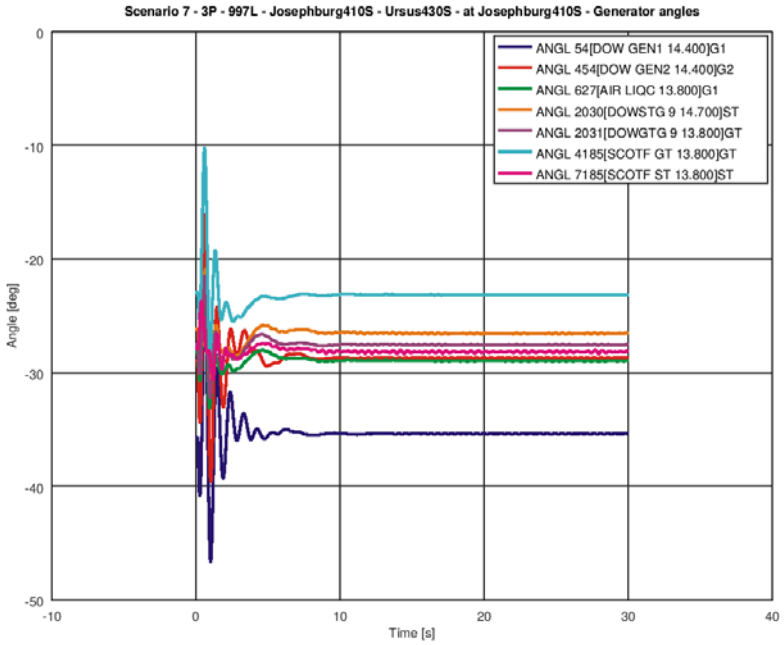


Figure A-551 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

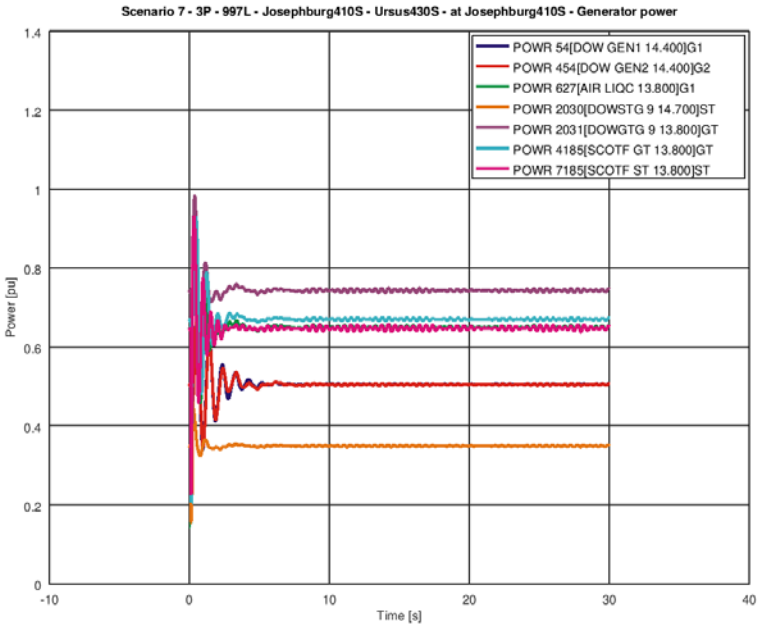


Figure A-552 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

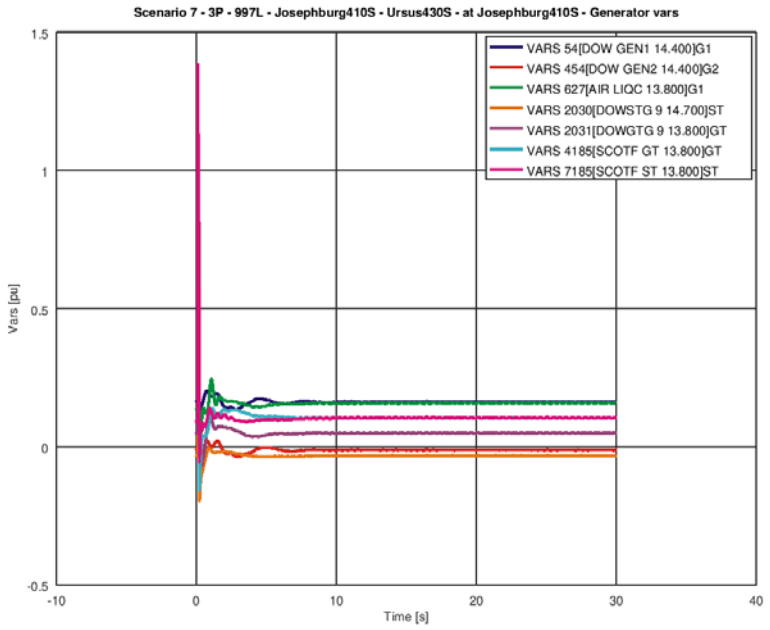


Figure A-553 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

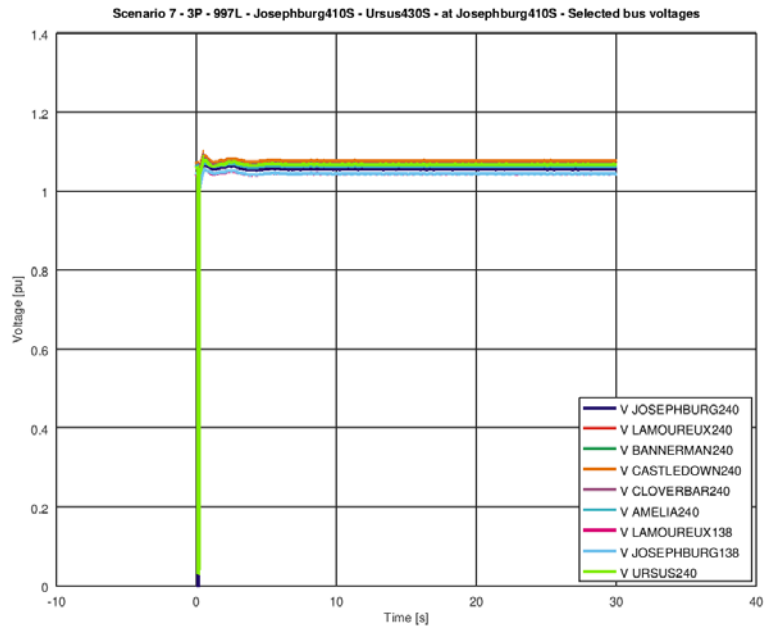


Figure A-554 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

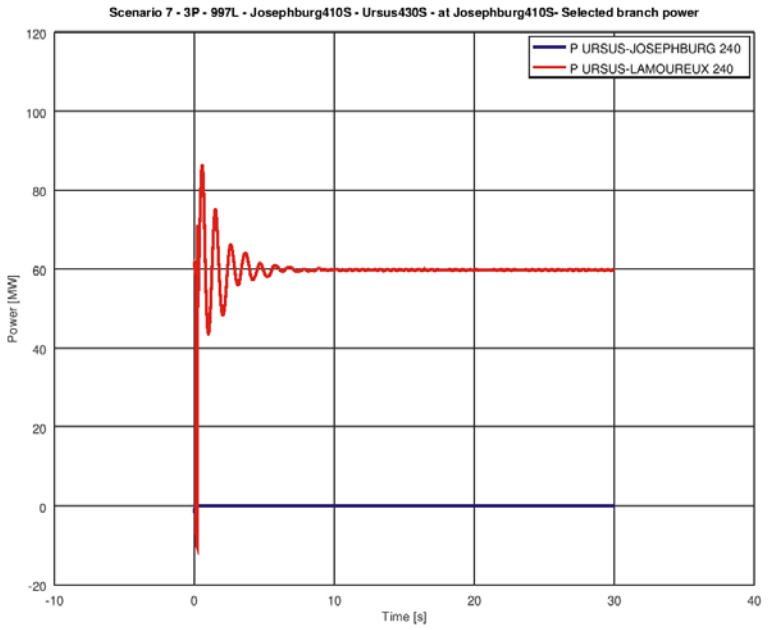


Figure A-555 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

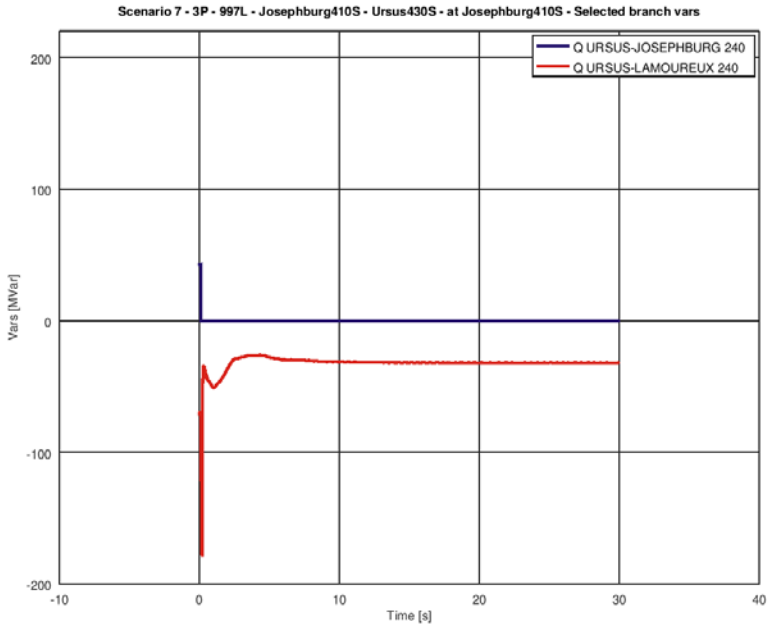


Figure A-556 Scenario 7 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

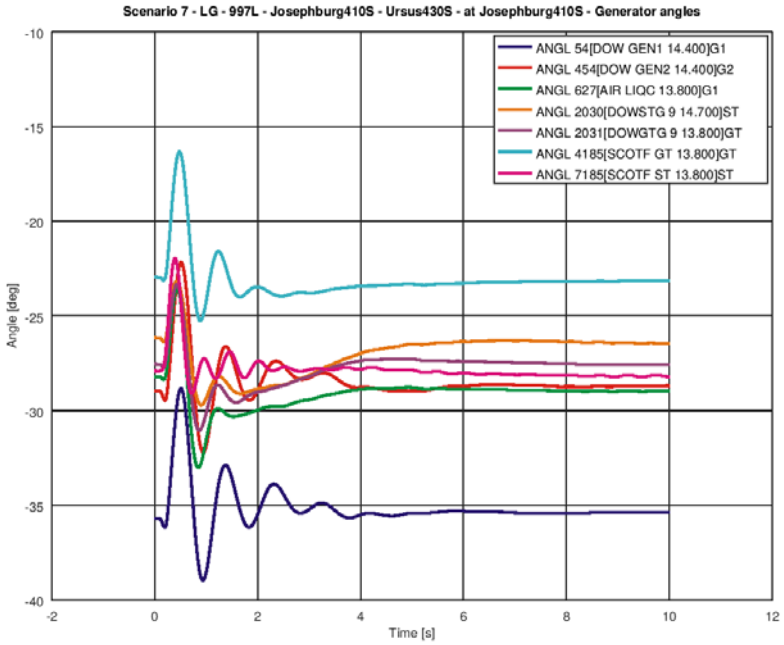


Figure A-557 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

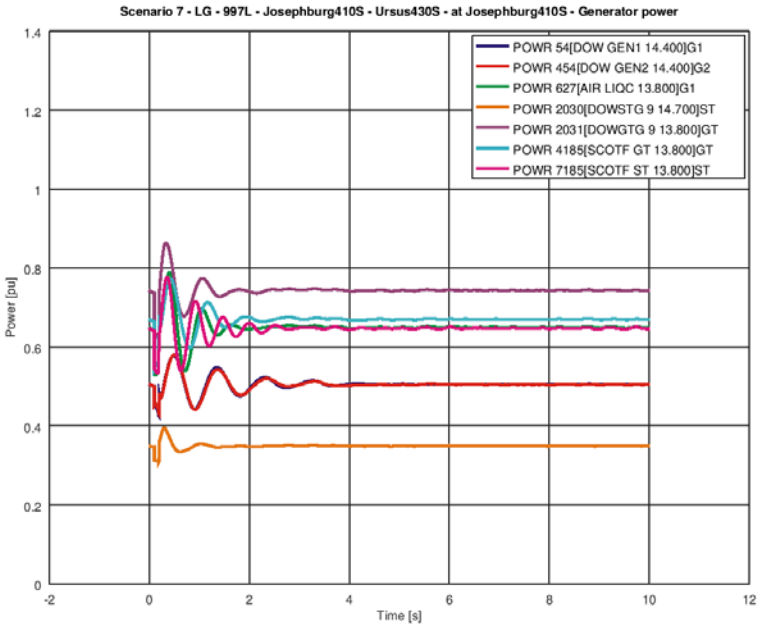


Figure A-558 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

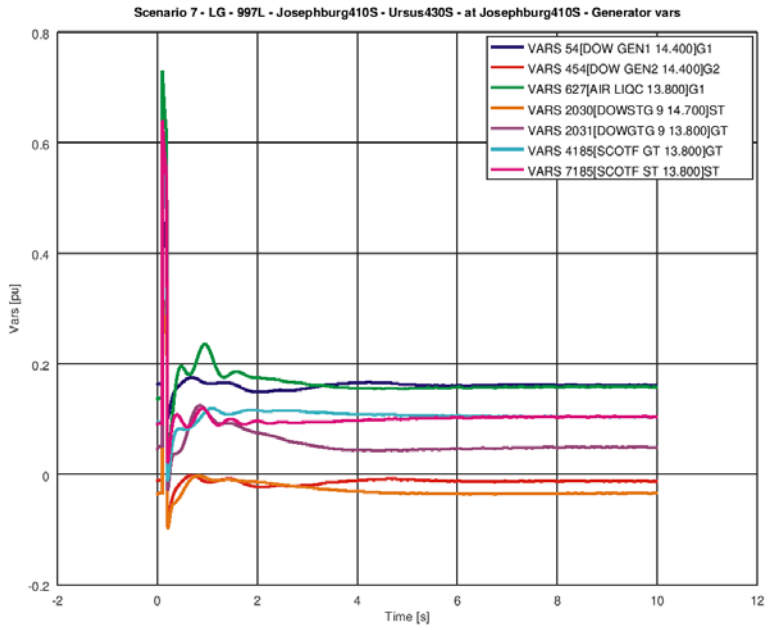


Figure A-559 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

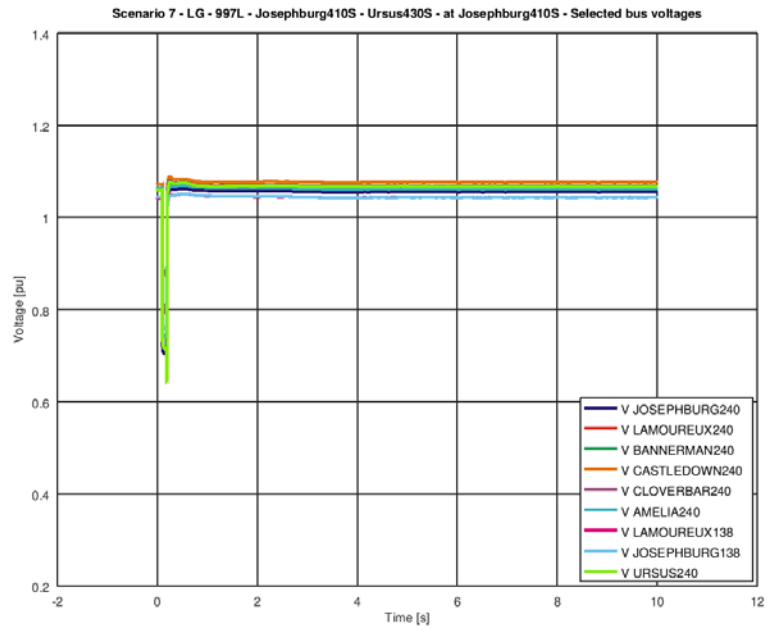


Figure A-560 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

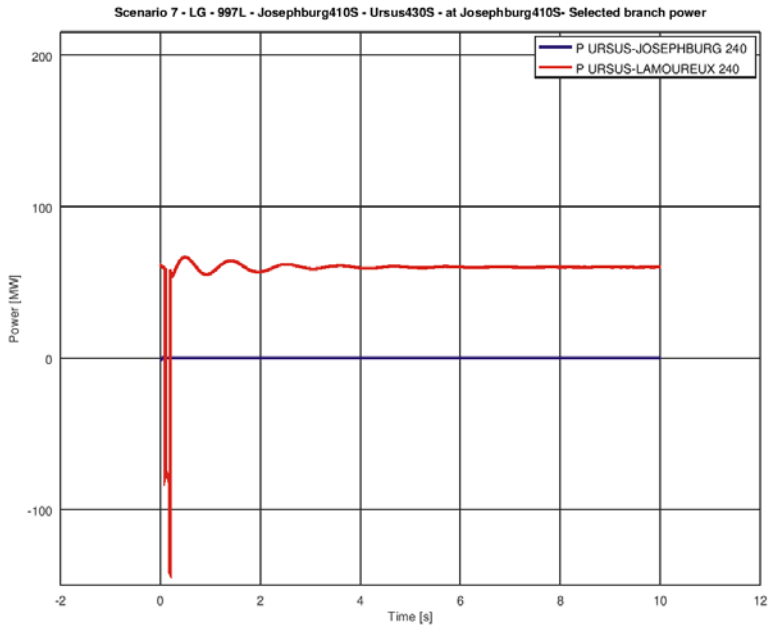


Figure A-561 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

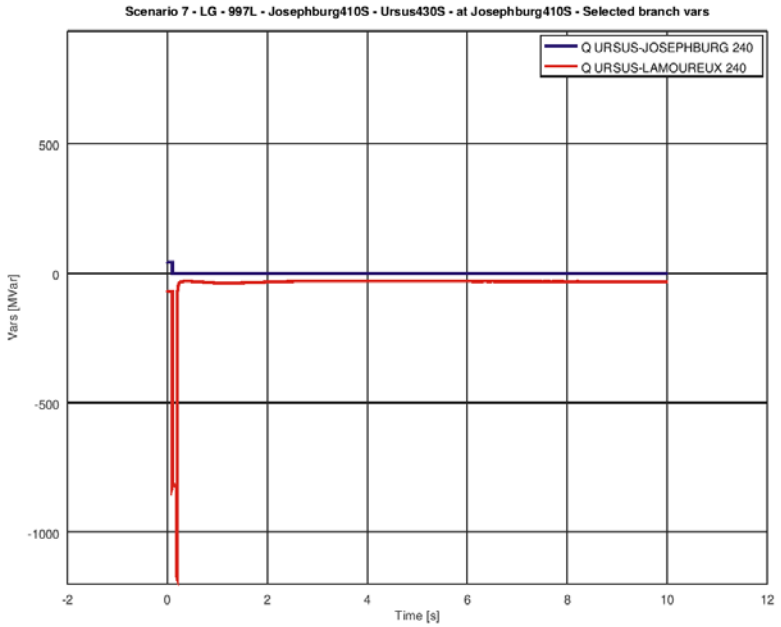


Figure A-562 Scenario 7 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

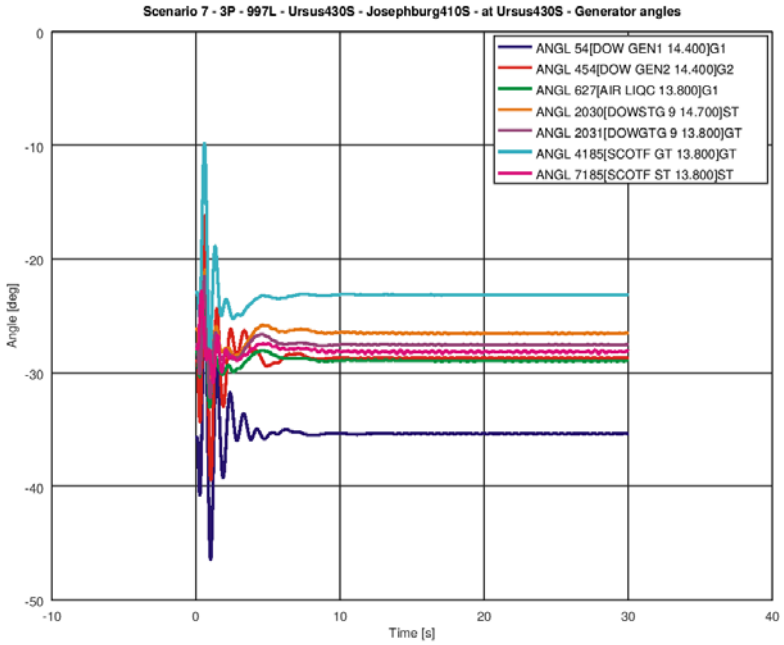


Figure A-563 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

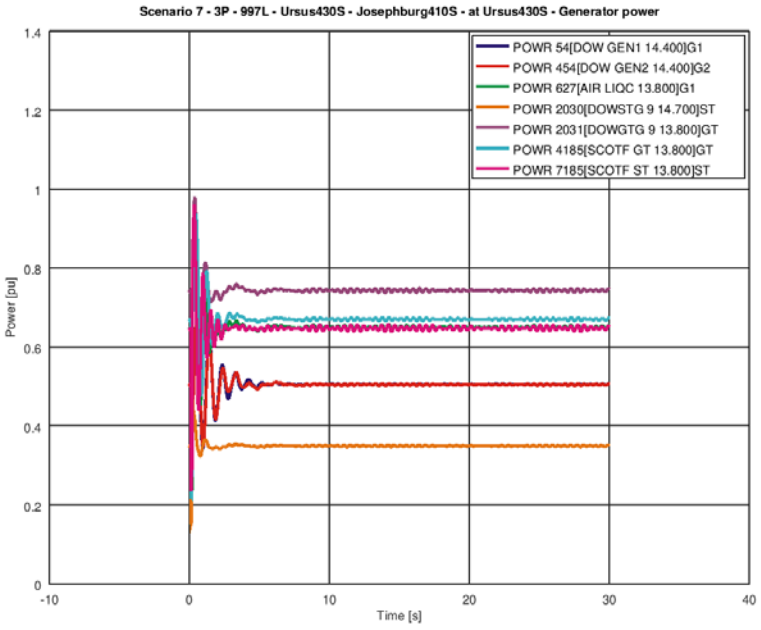


Figure A-564 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

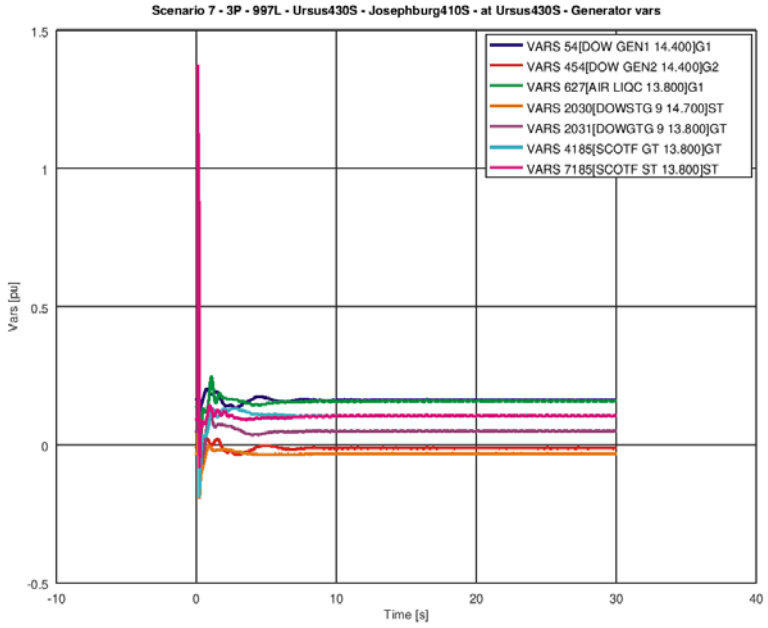


Figure A-565 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

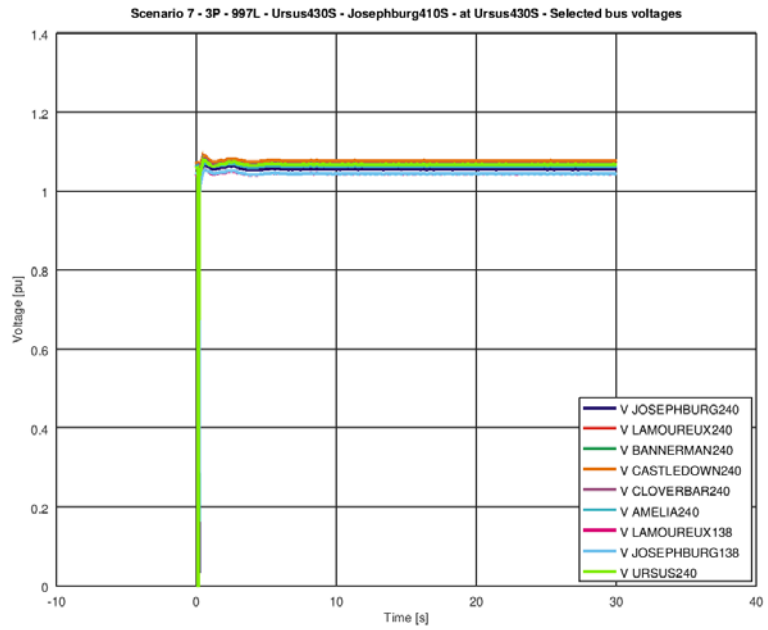


Figure A-566 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

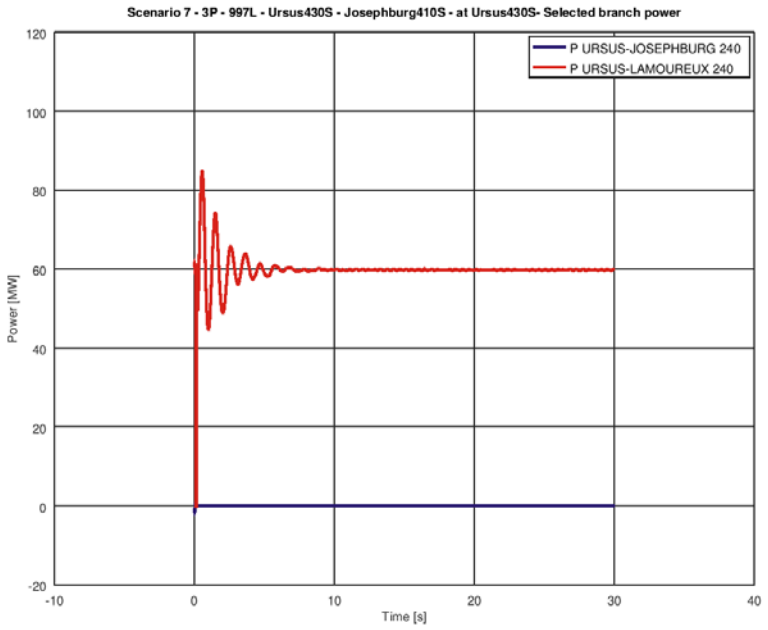


Figure A-567 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch power

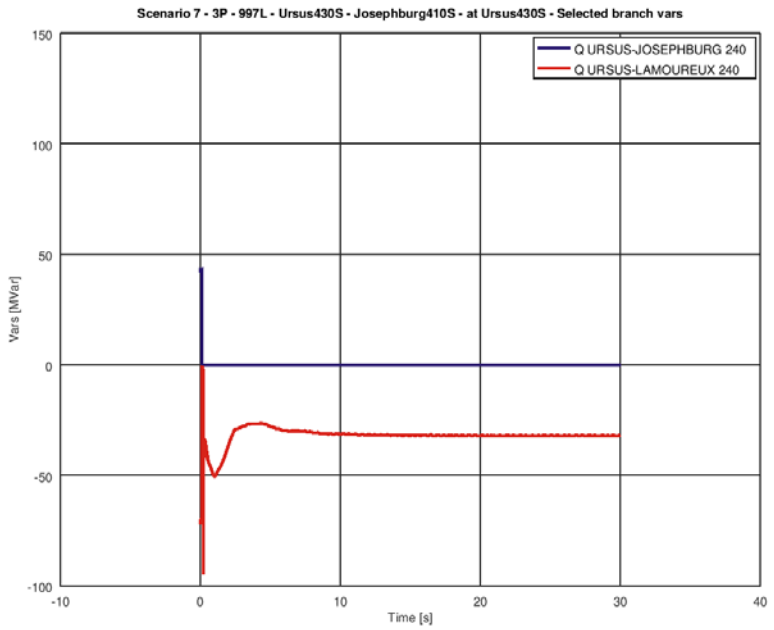


Figure A-568 Scenario 7 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch vars

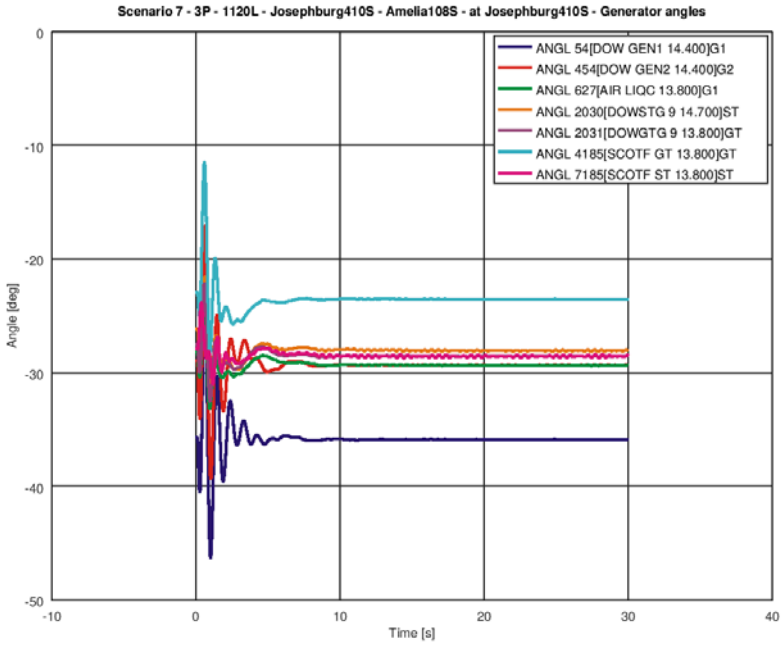


Figure A-569 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

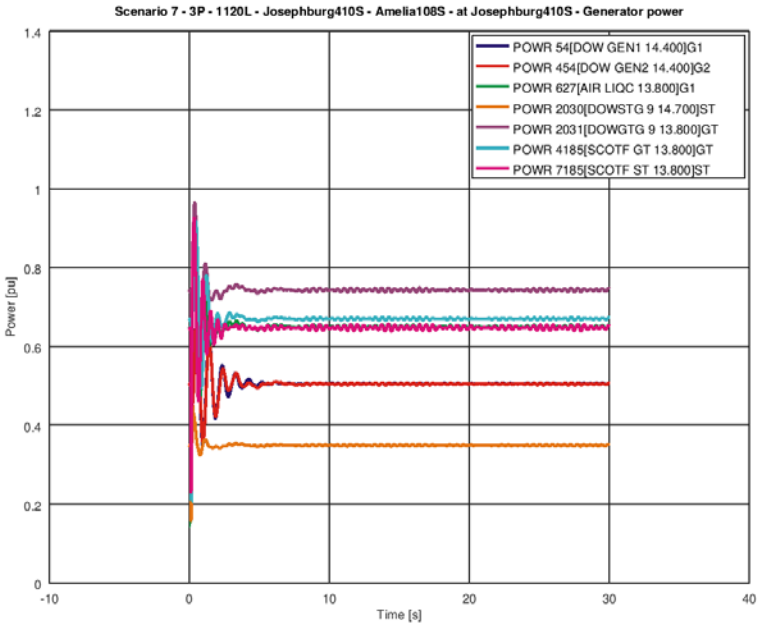


Figure A-570 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

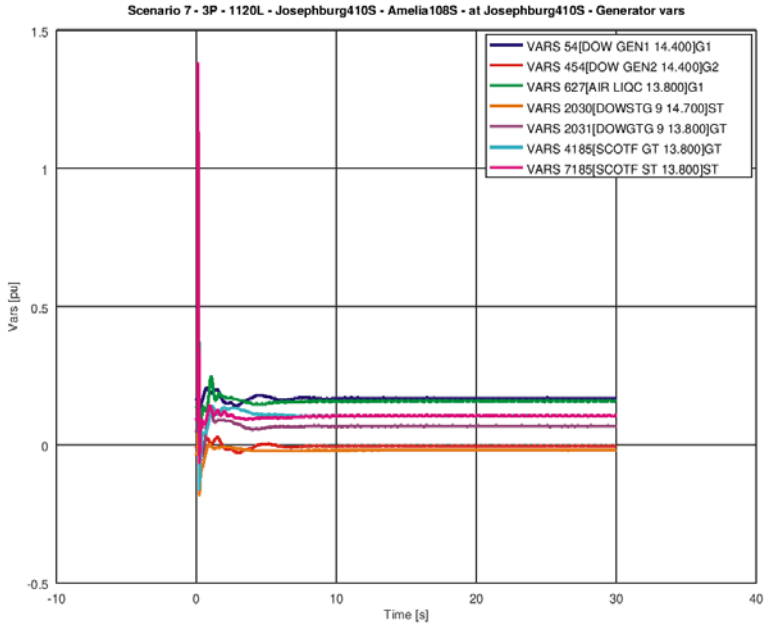


Figure A-571 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

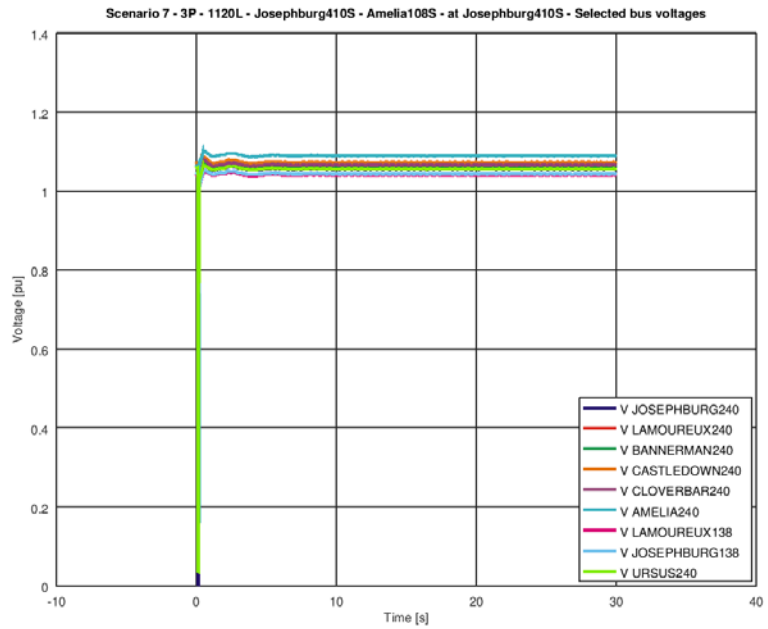


Figure A-572 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

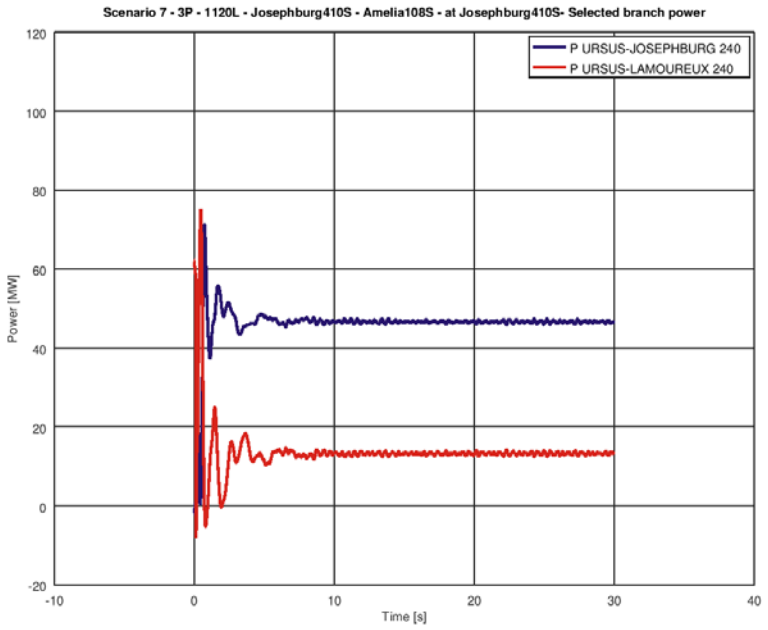


Figure A-573 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

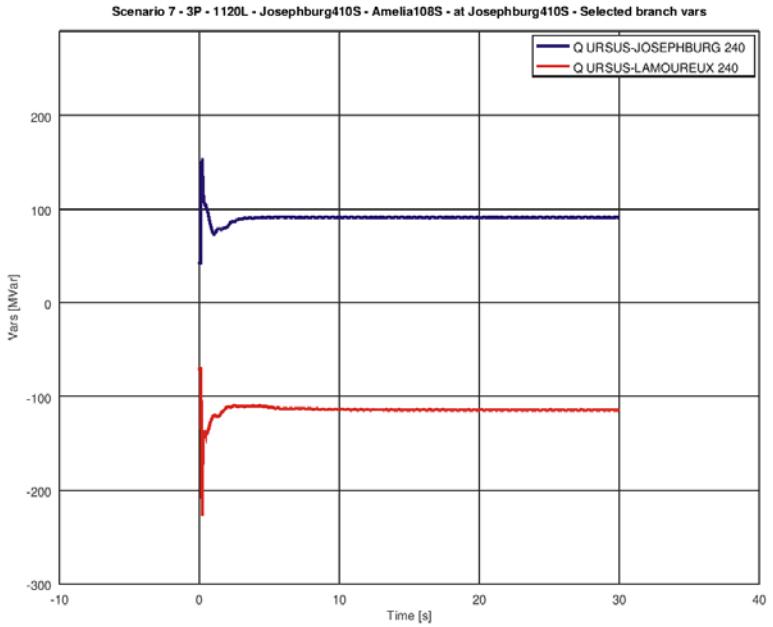


Figure A-574 Scenario 7 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

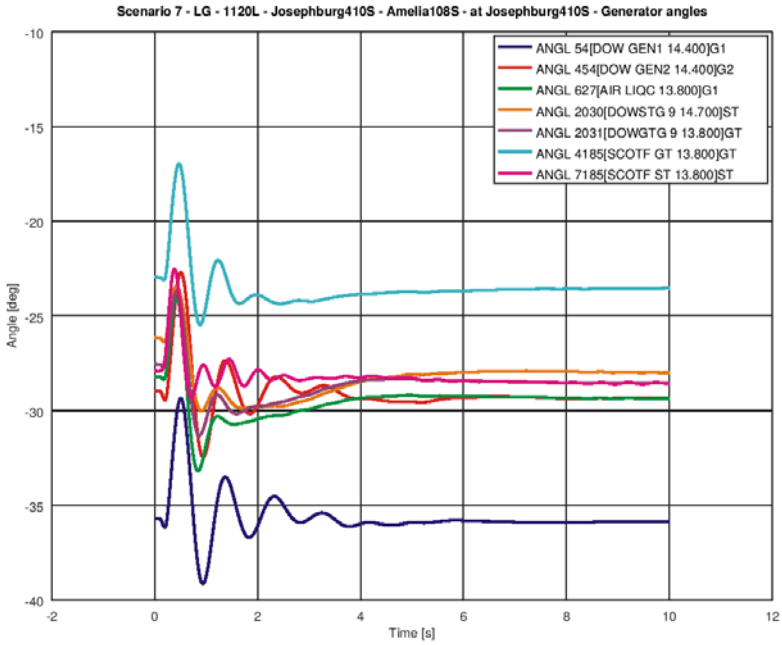


Figure A-575 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

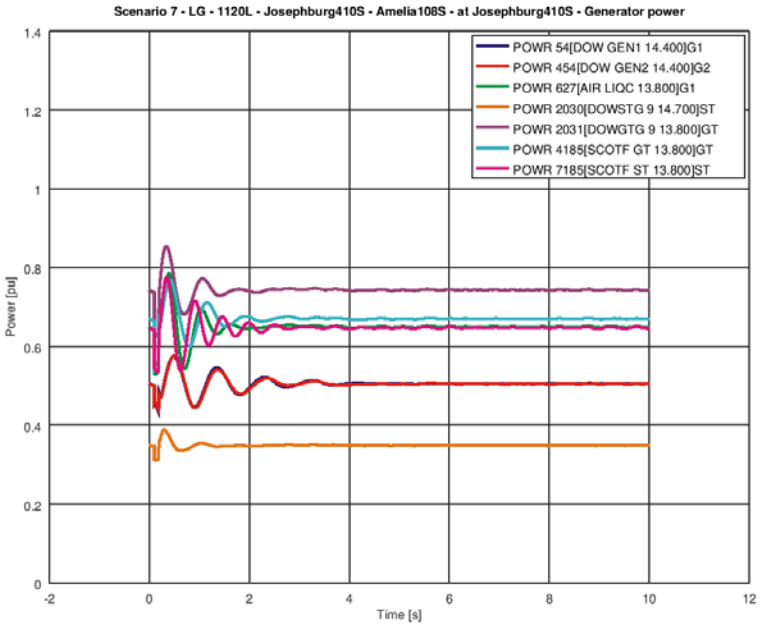


Figure A-576 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

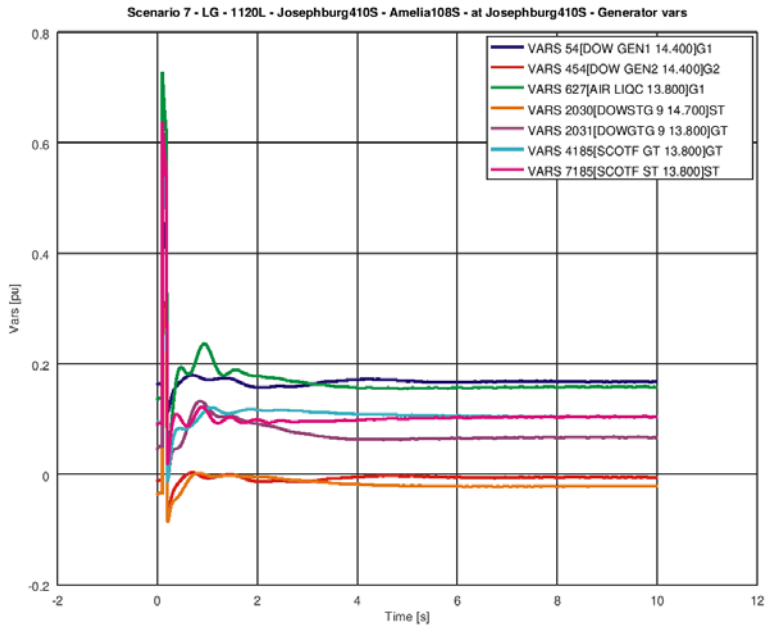


Figure A-577 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

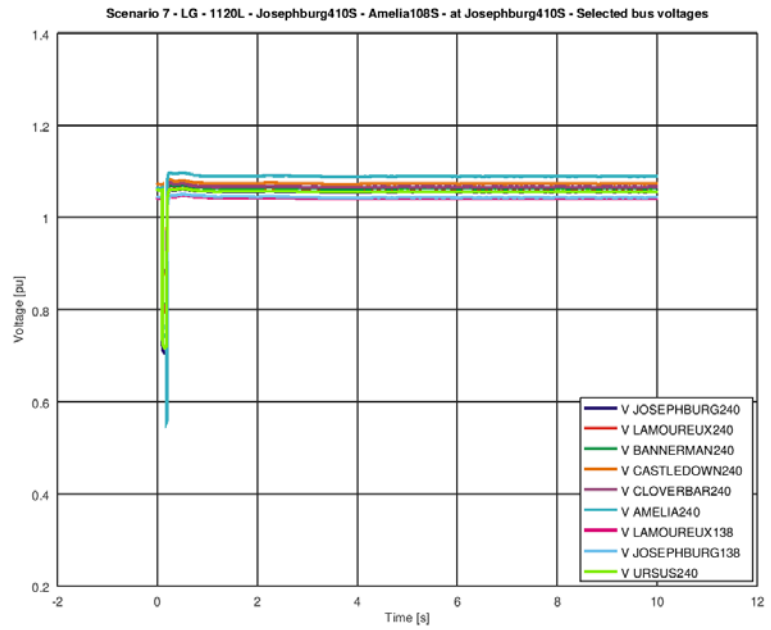


Figure A-578 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

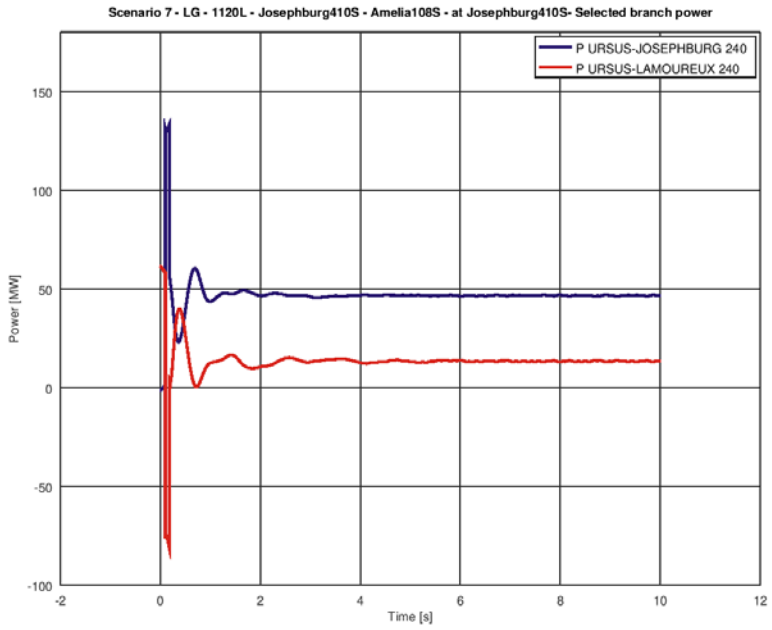


Figure A-579 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

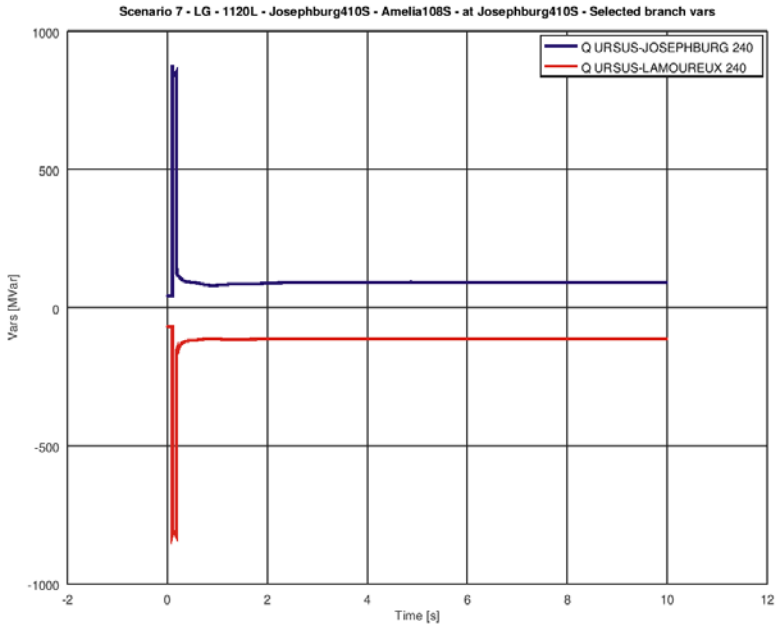


Figure A-580 Scenario 7 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

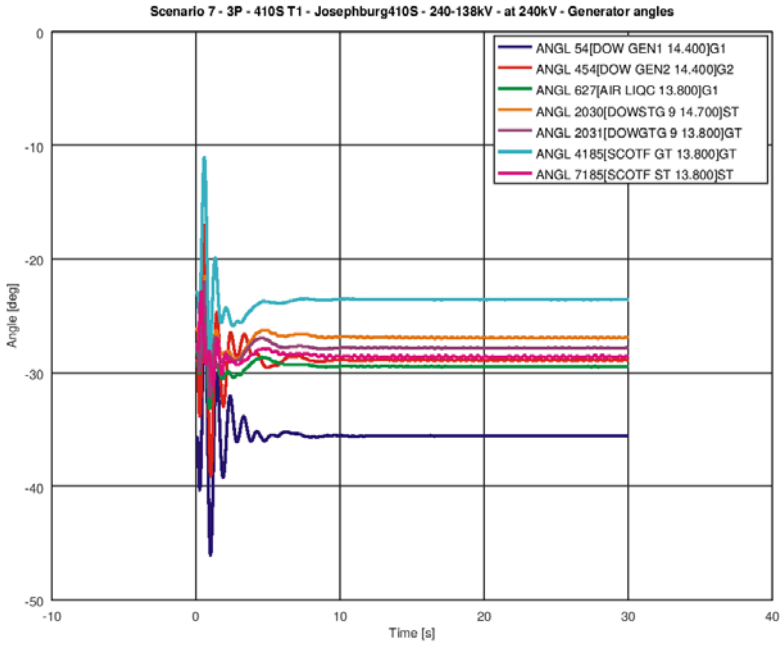


Figure A-581 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator angles

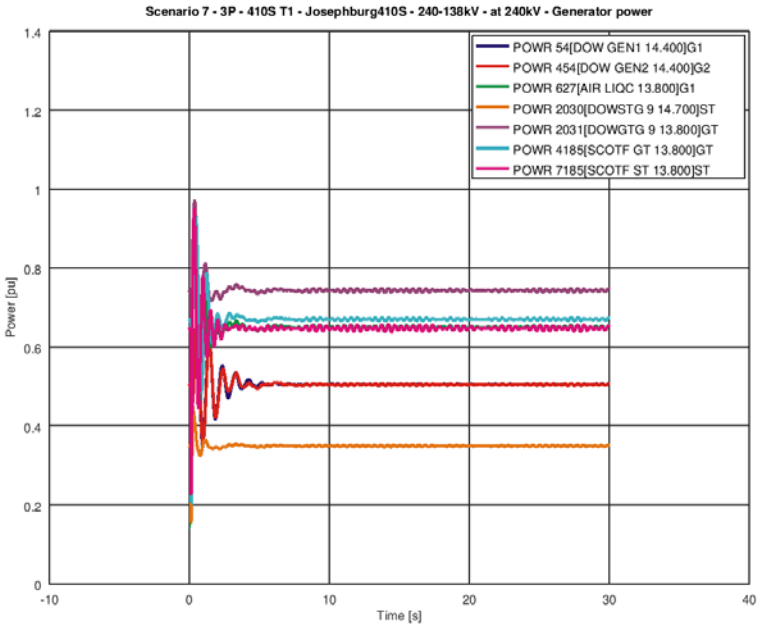


Figure A-582 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator power

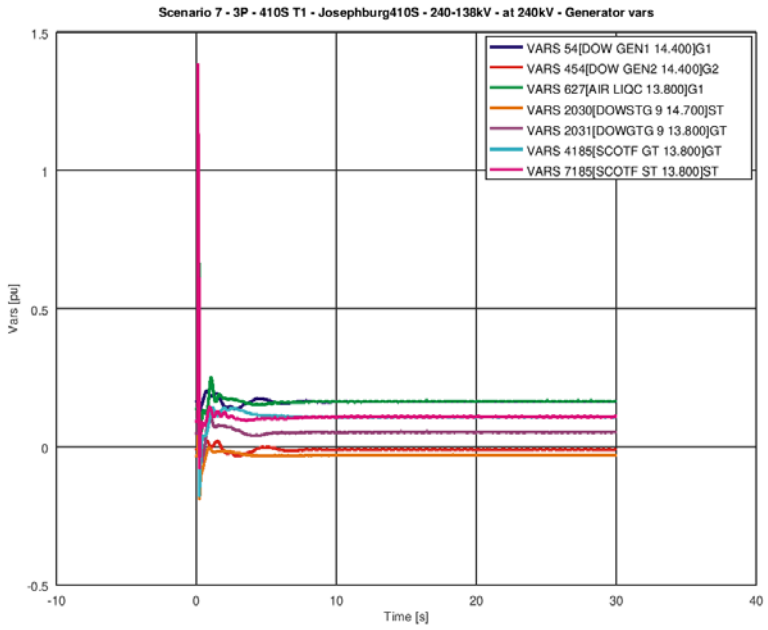


Figure A-583 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator vars

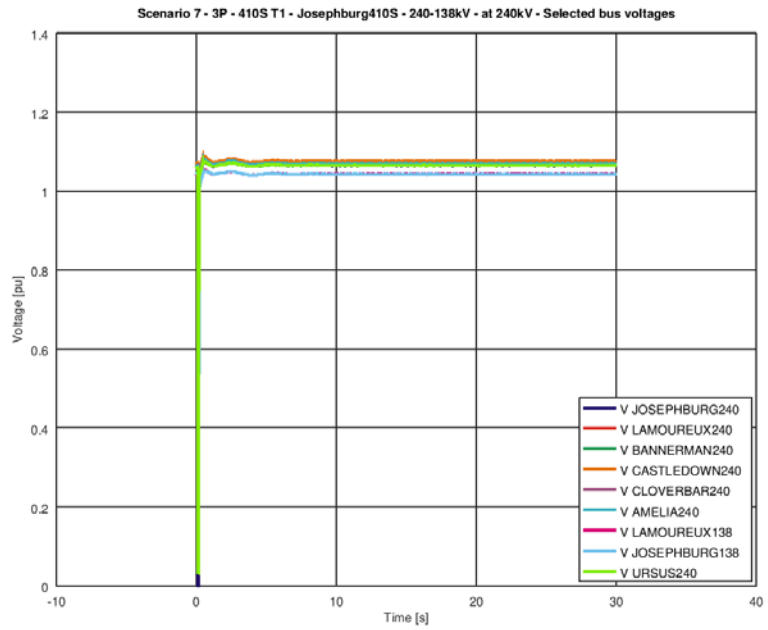


Figure A-584 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected bus voltages

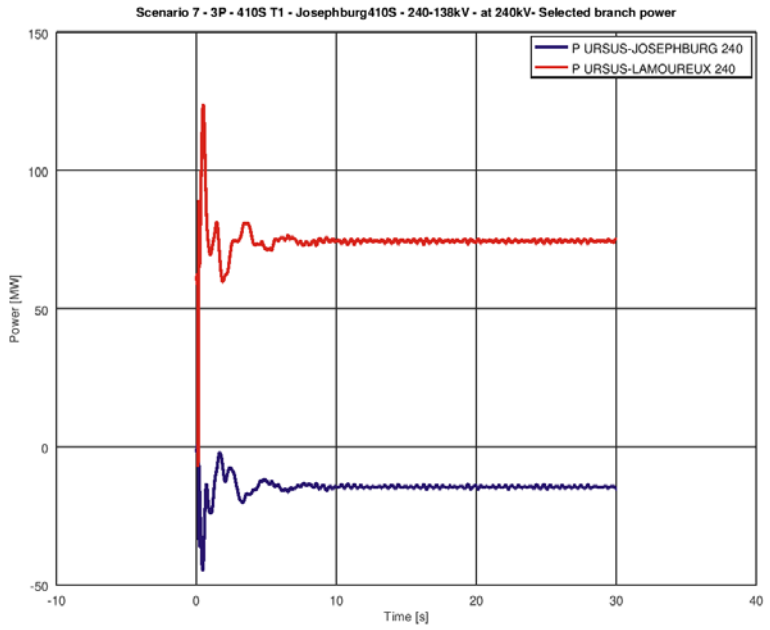


Figure A-585 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected branch power

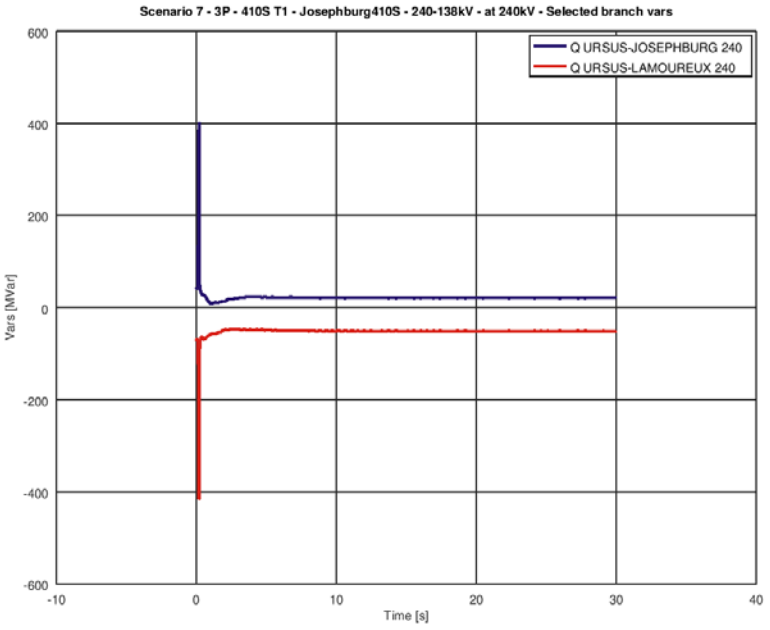


Figure A-586 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected branch vars

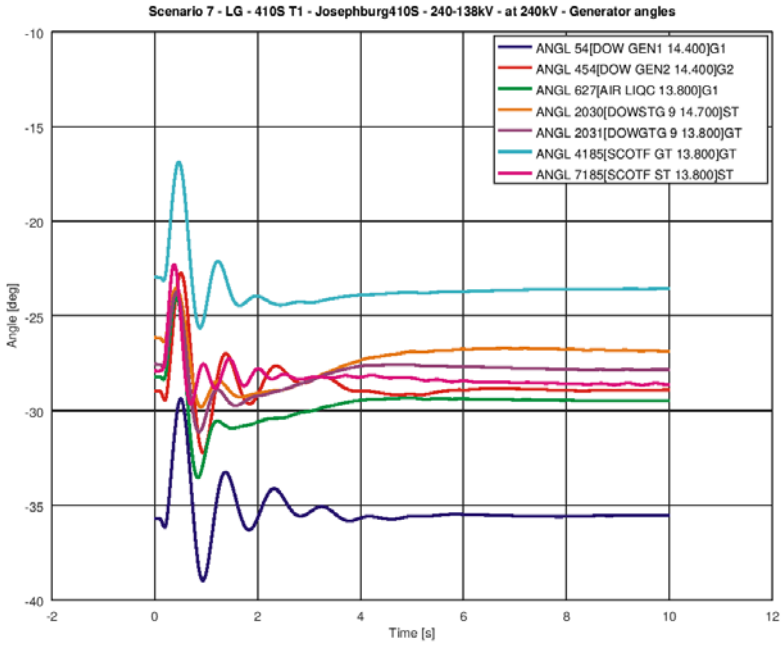


Figure A-587 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator angles

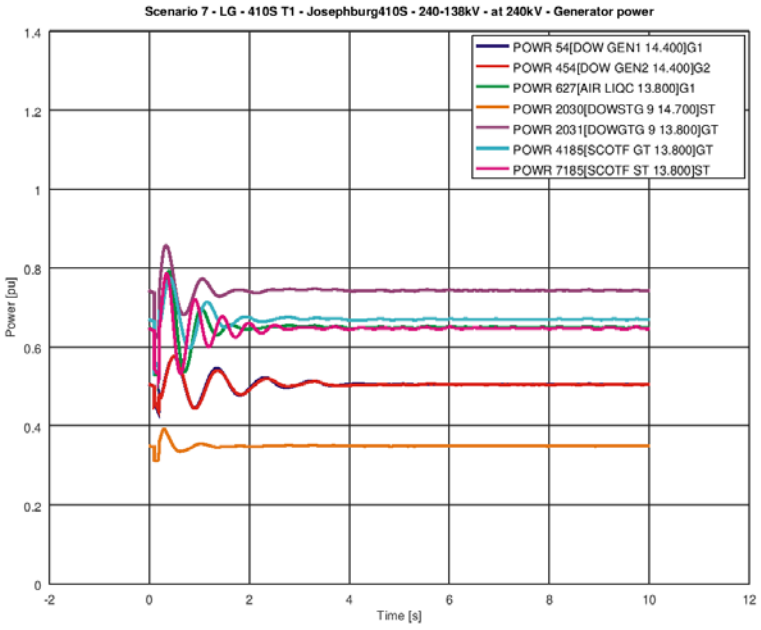


Figure A-588 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator power

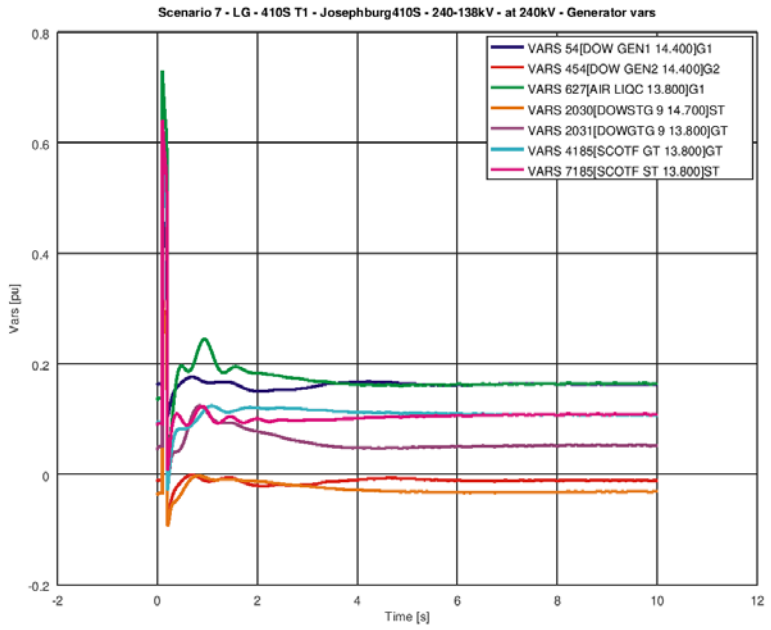


Figure A-589 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Generator vars

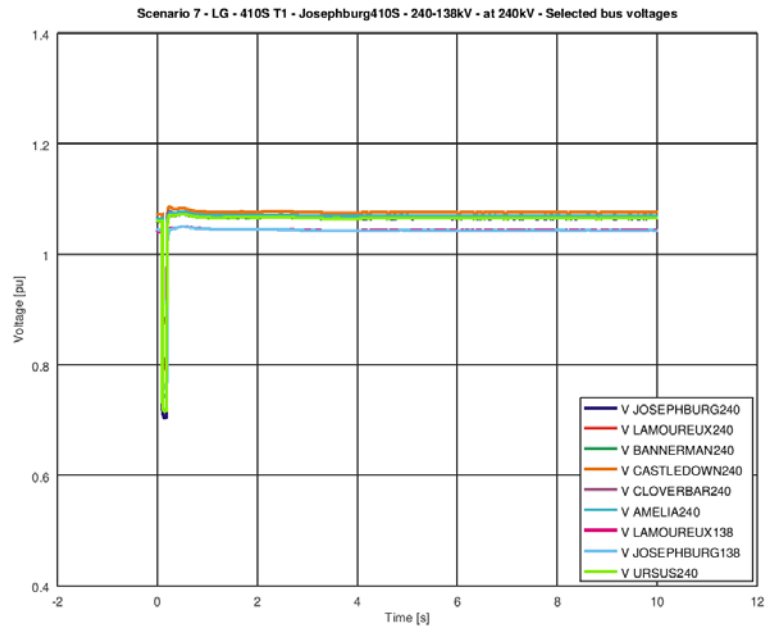


Figure A-590 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected bus voltages

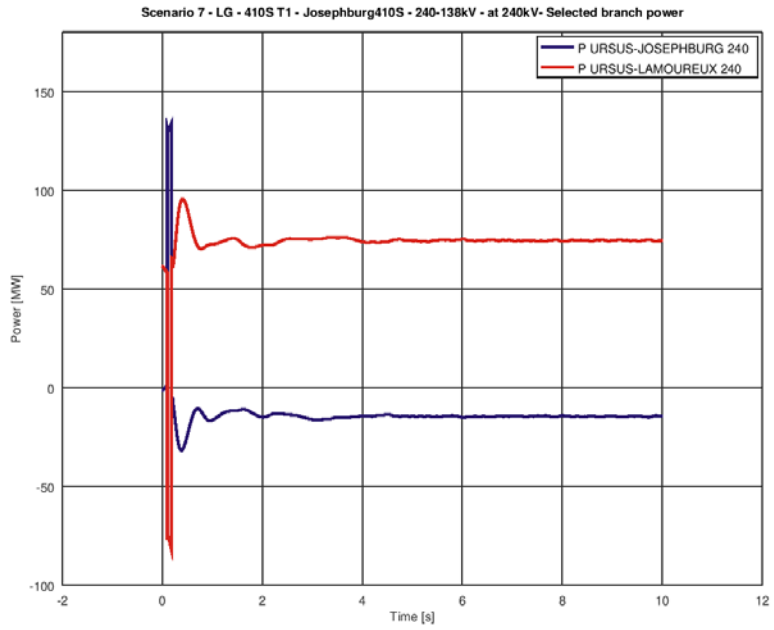


Figure A-591 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected branch power

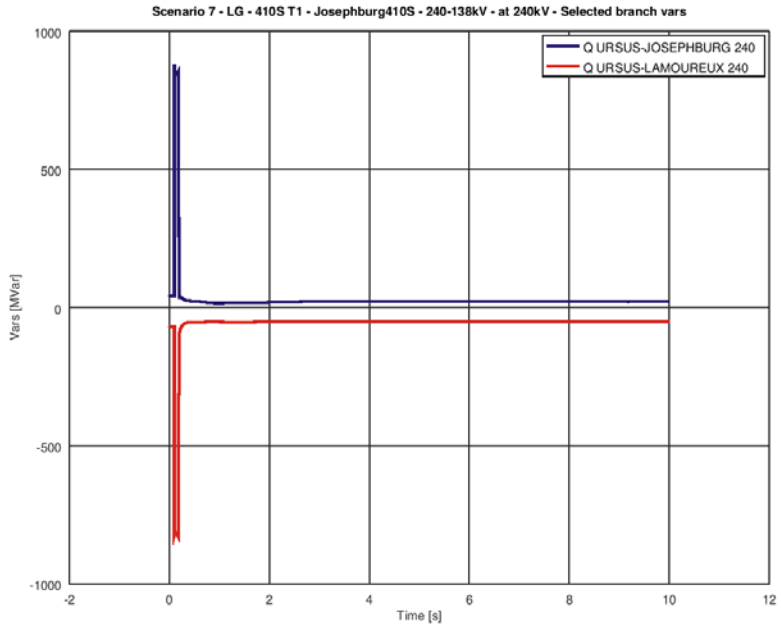


Figure A-592 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (240kV) - Selected branch vars

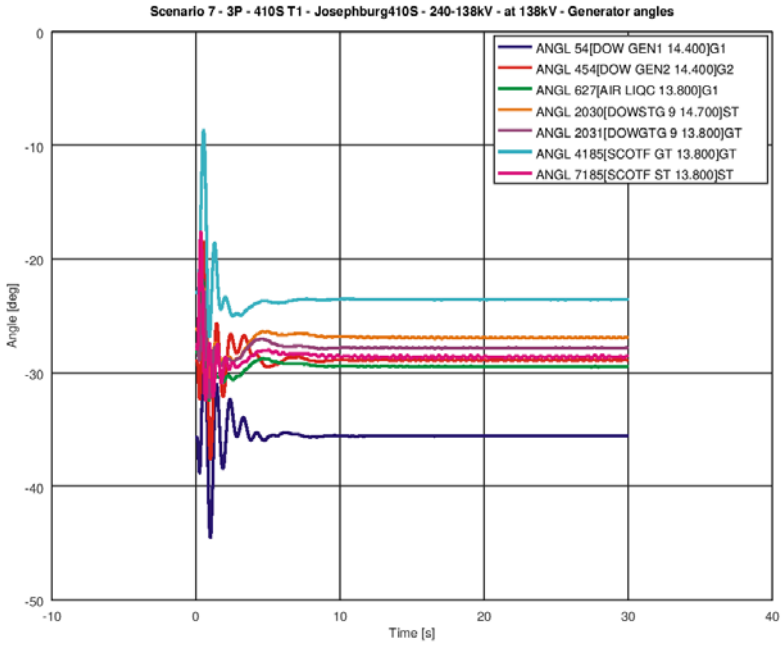


Figure A-593 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator angles

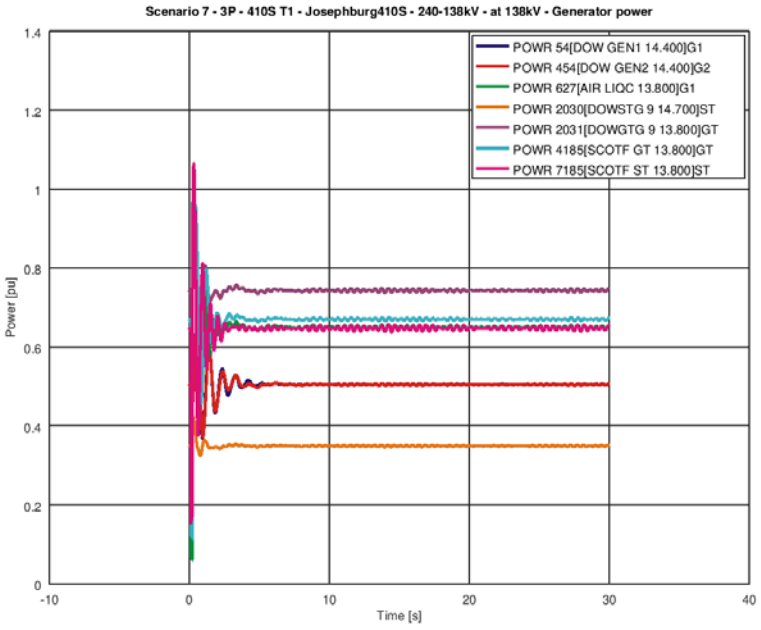


Figure A-594 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator power

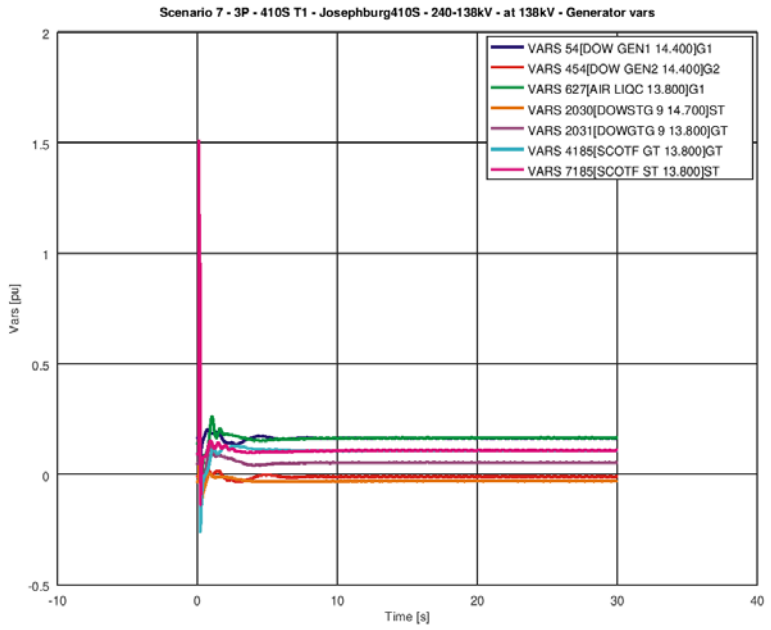


Figure A-595 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator vars

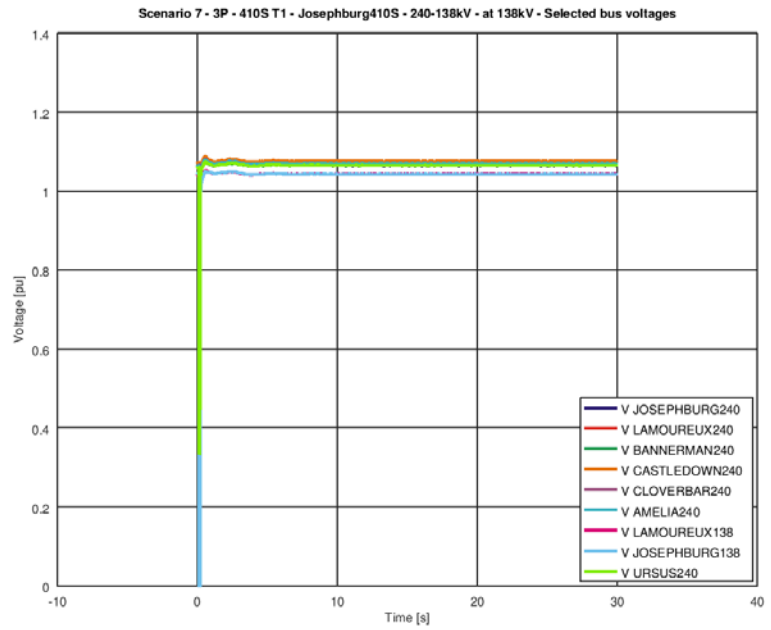


Figure A-596 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected bus voltages

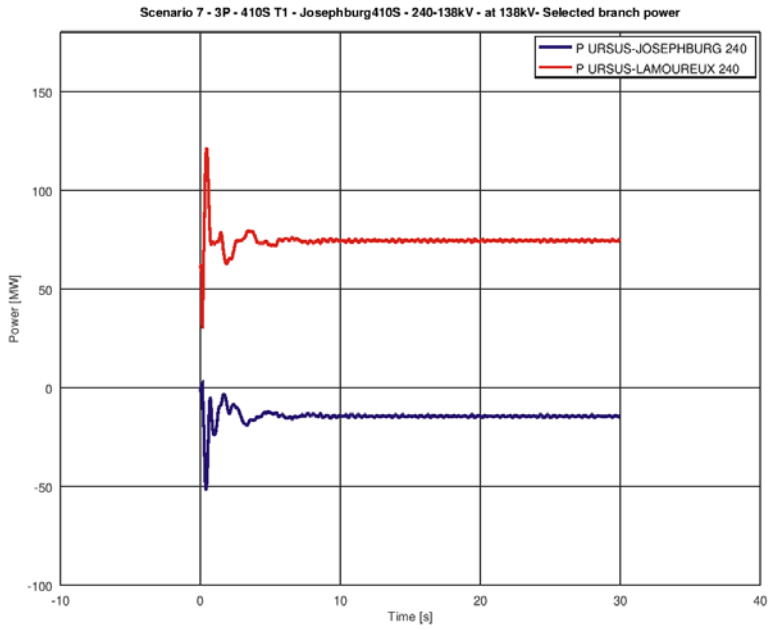


Figure A-597 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected branch power

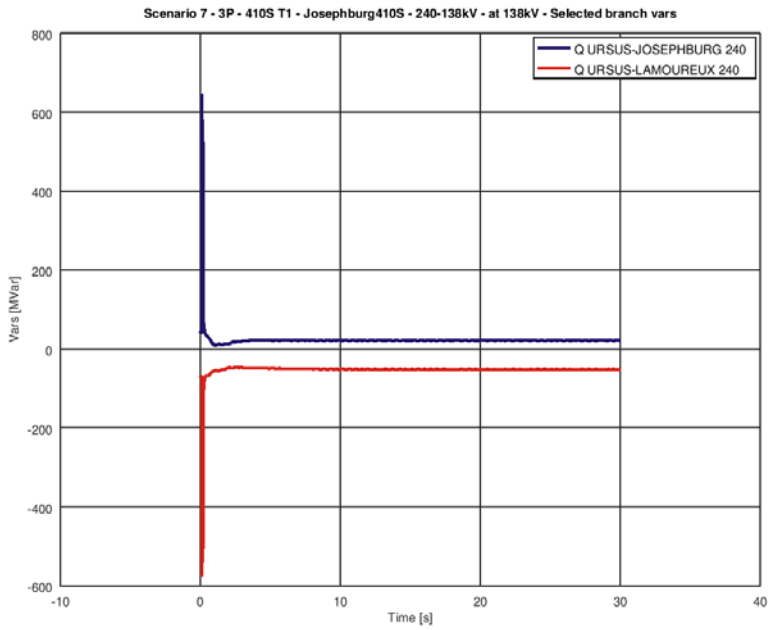


Figure A-598 Scenario 7 - 3P - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected branch vars

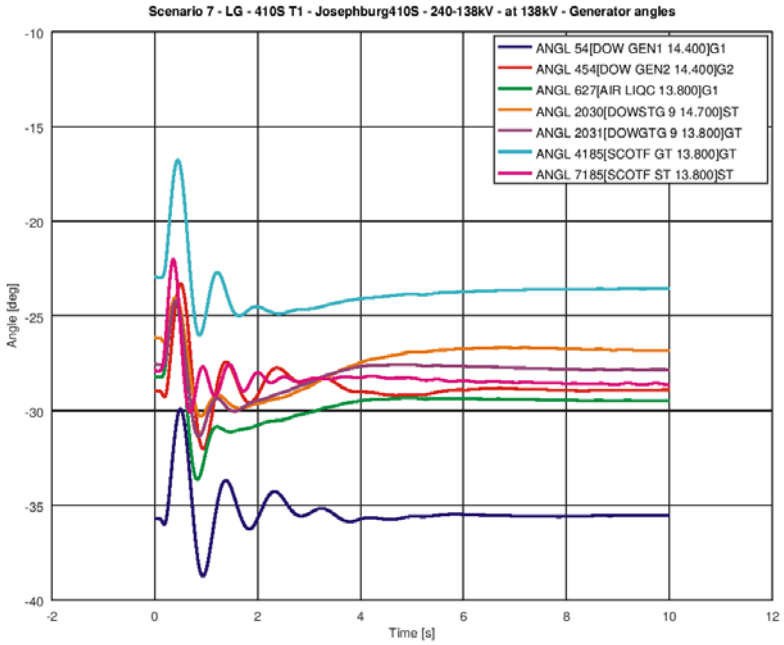


Figure A-599 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator angles

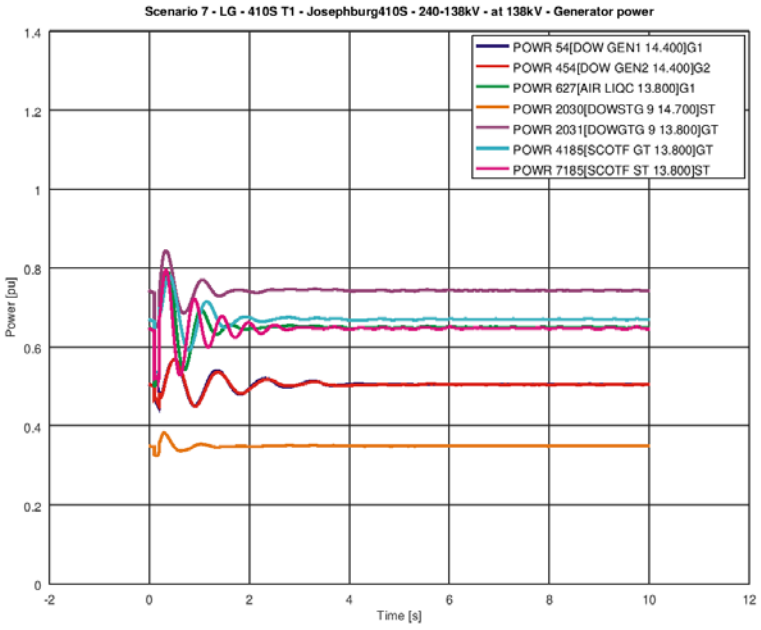


Figure A-600 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator power

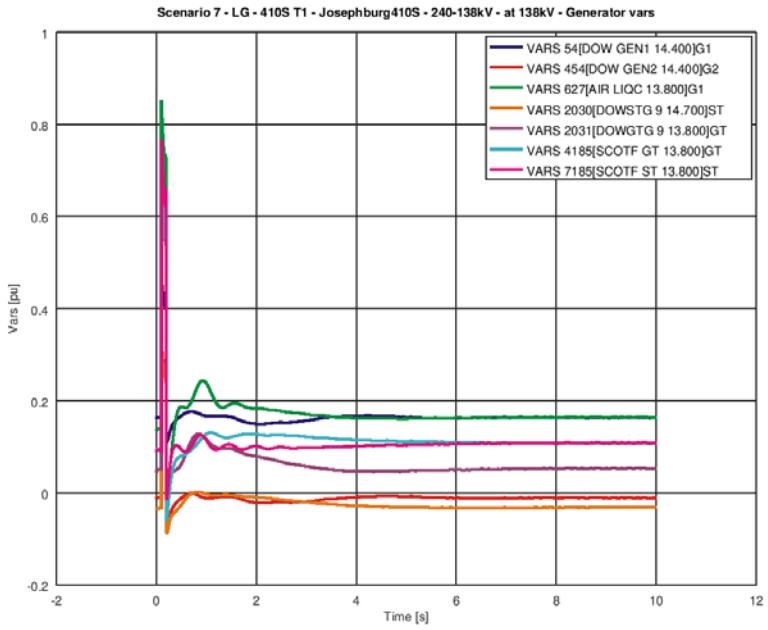


Figure A-601 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Generator vars

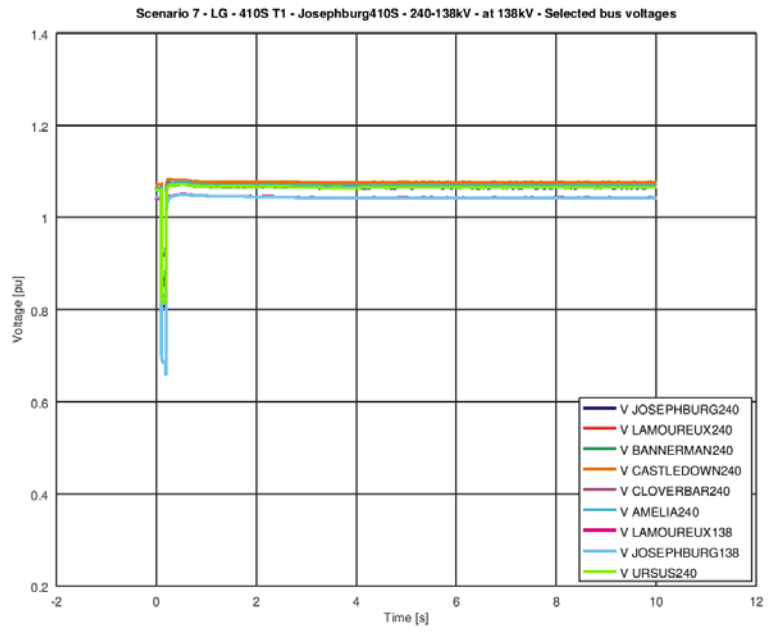


Figure A-602 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected bus voltages

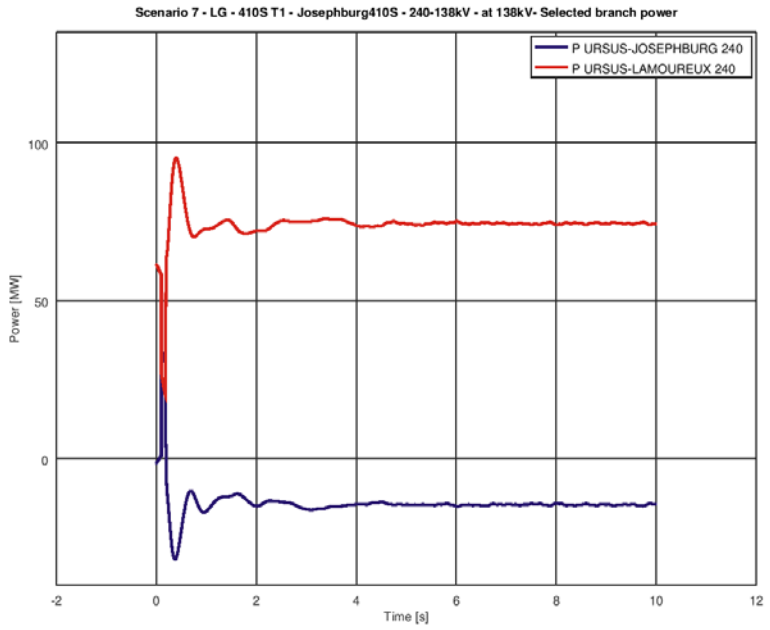


Figure A-603 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected branch power

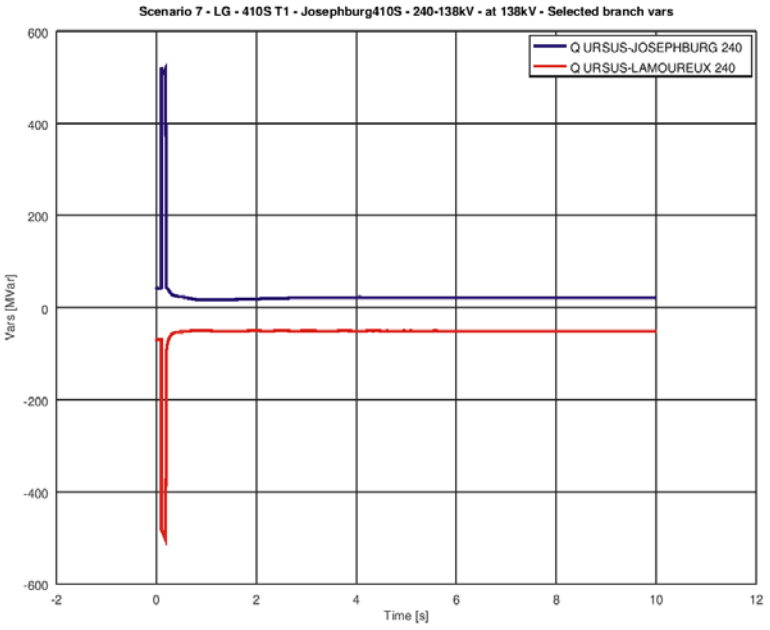


Figure A-604 Scenario 7 - LG - 410S T1 - Josephburg410S - 240-138kV - at (138kV) - Selected branch vars

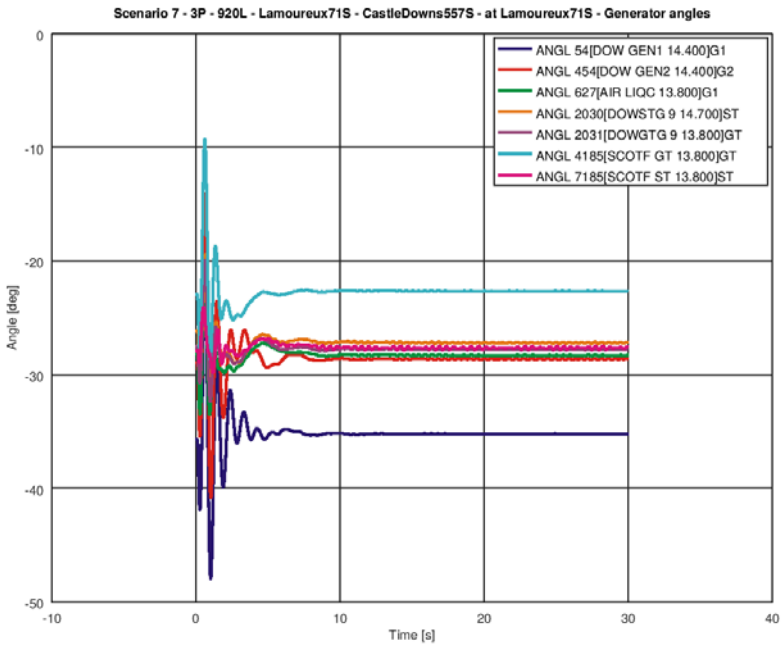


Figure A-605 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

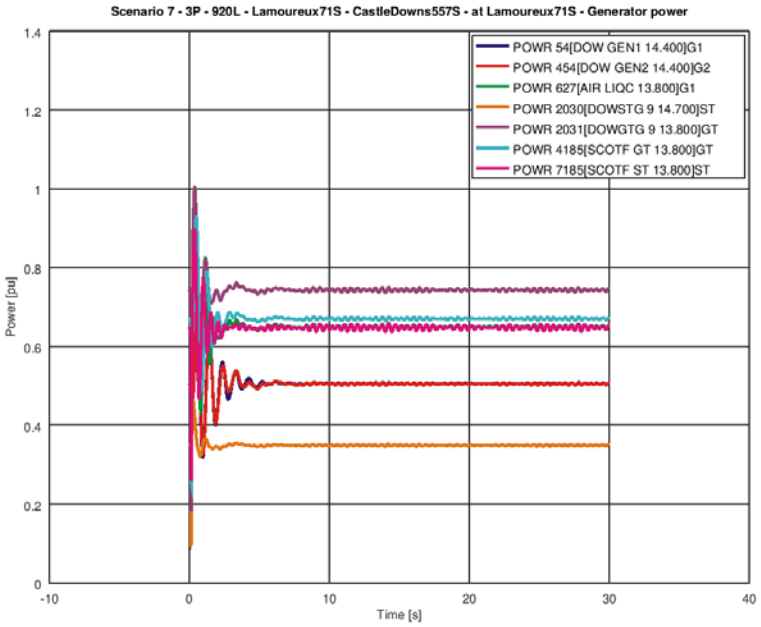


Figure A-606 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

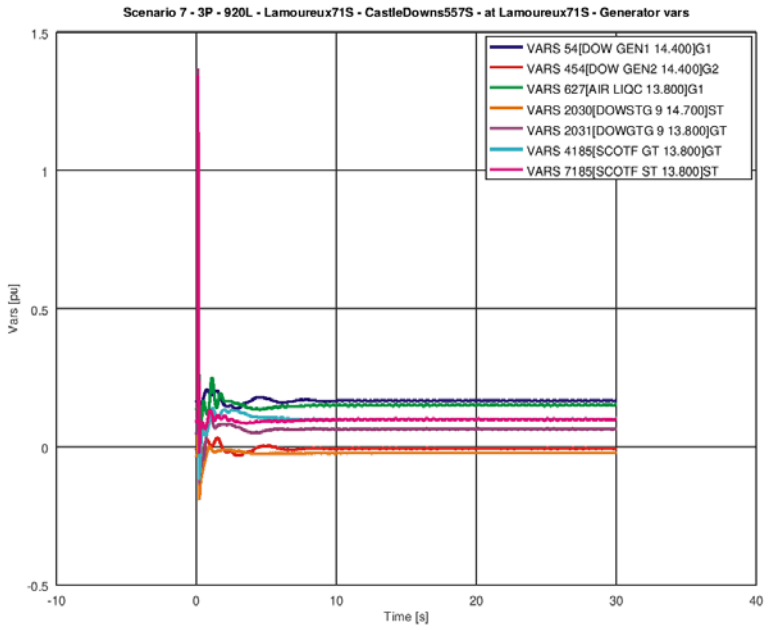


Figure A-607 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

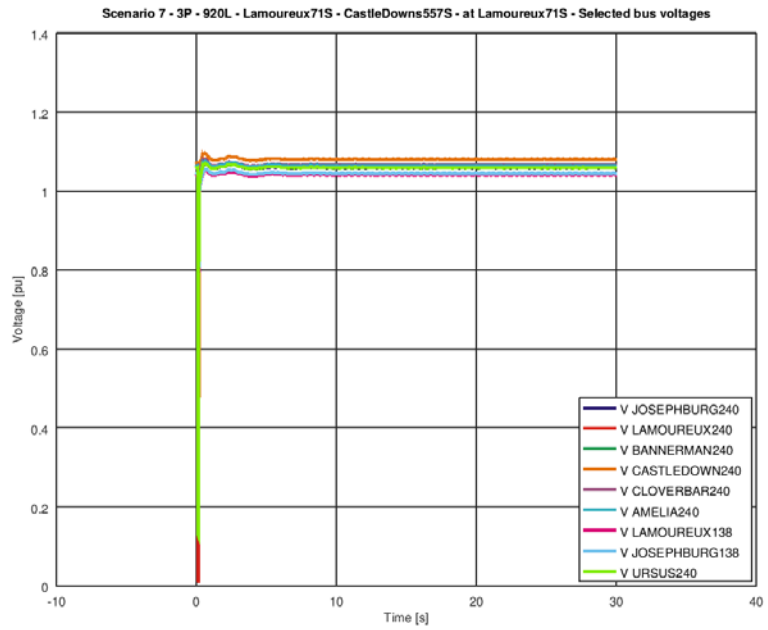


Figure A-608 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

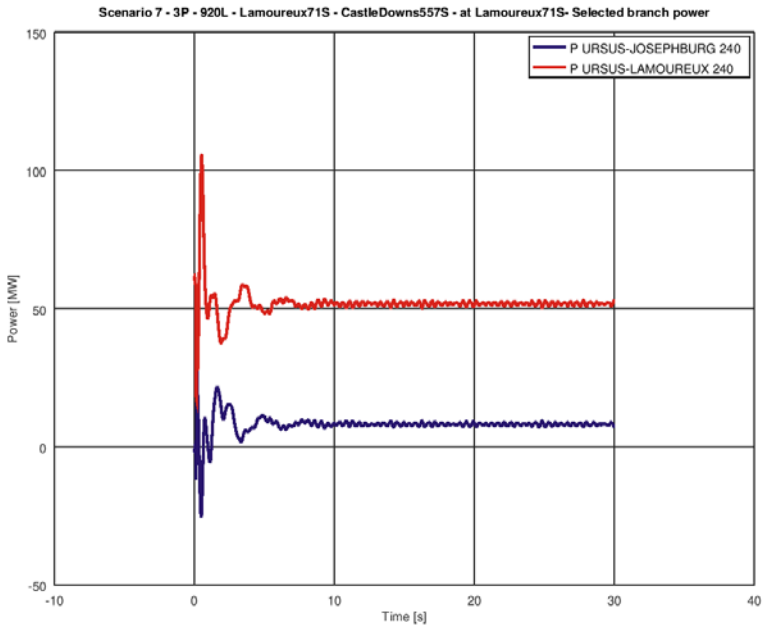


Figure A-609 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

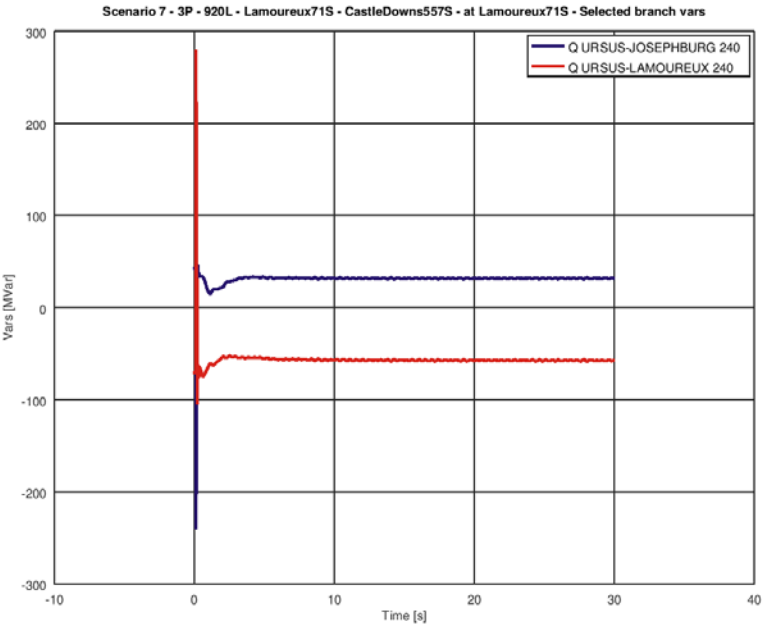


Figure A-610 Scenario 7 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

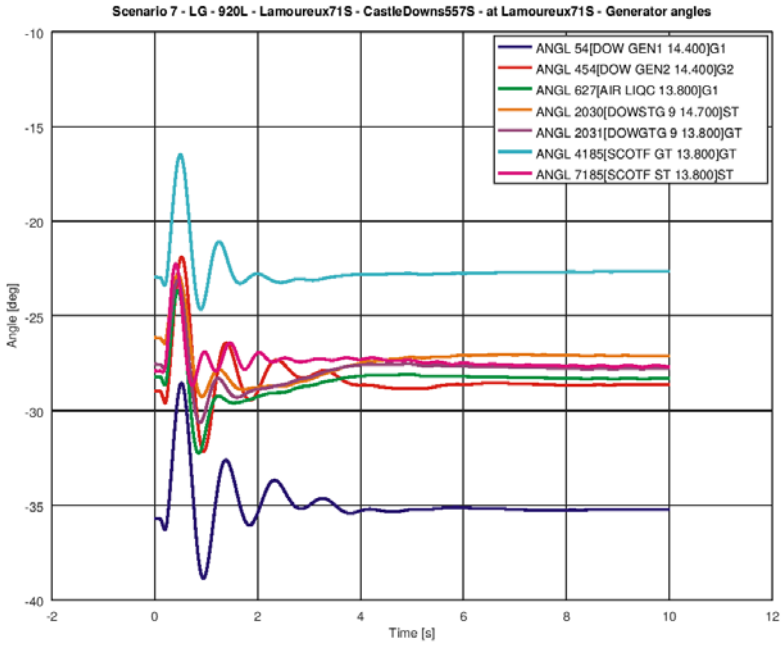


Figure A-611 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

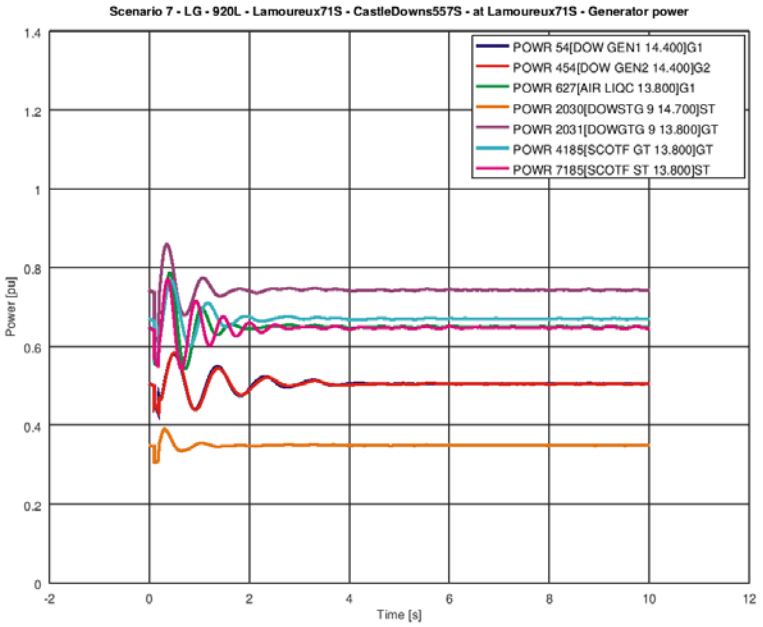


Figure A-612 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

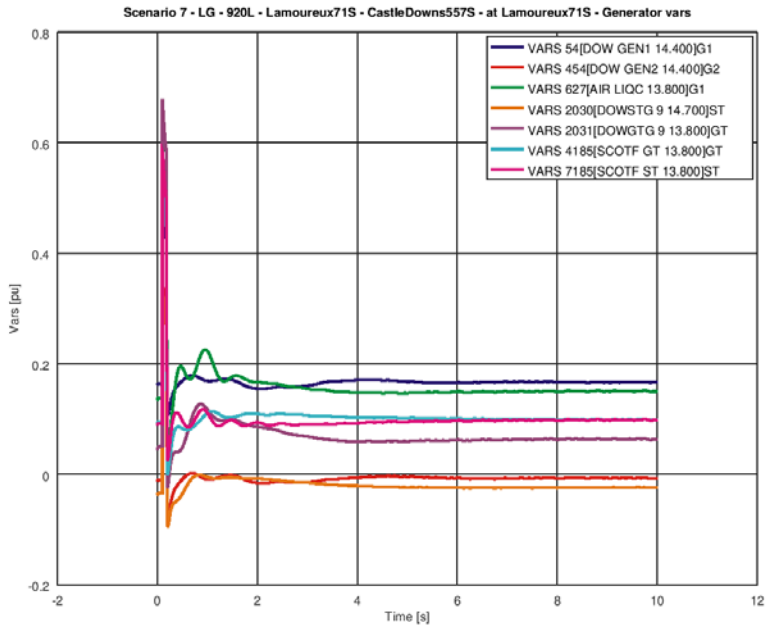


Figure A-613 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

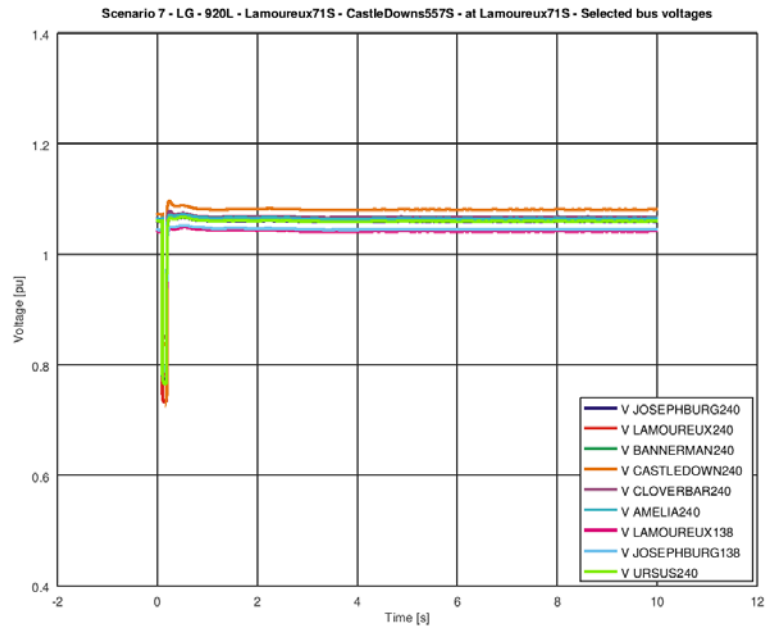


Figure A-614 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

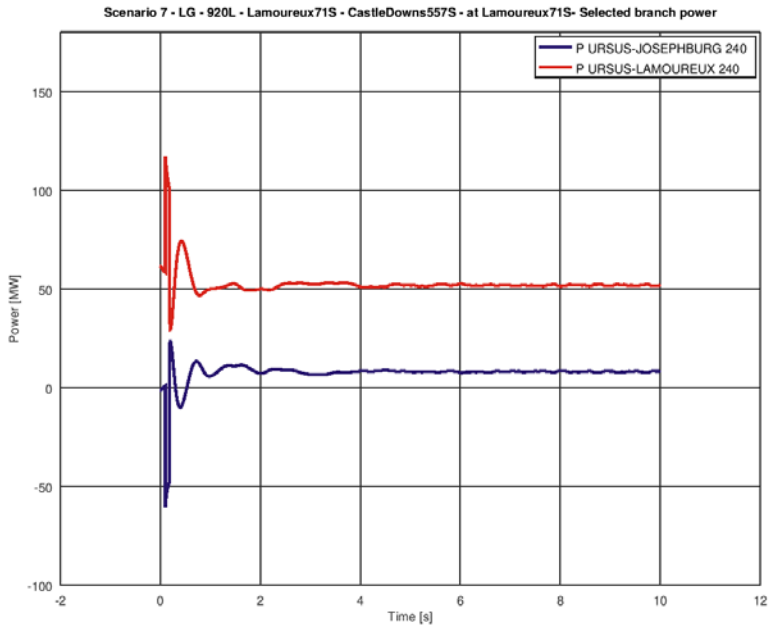


Figure A-615 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

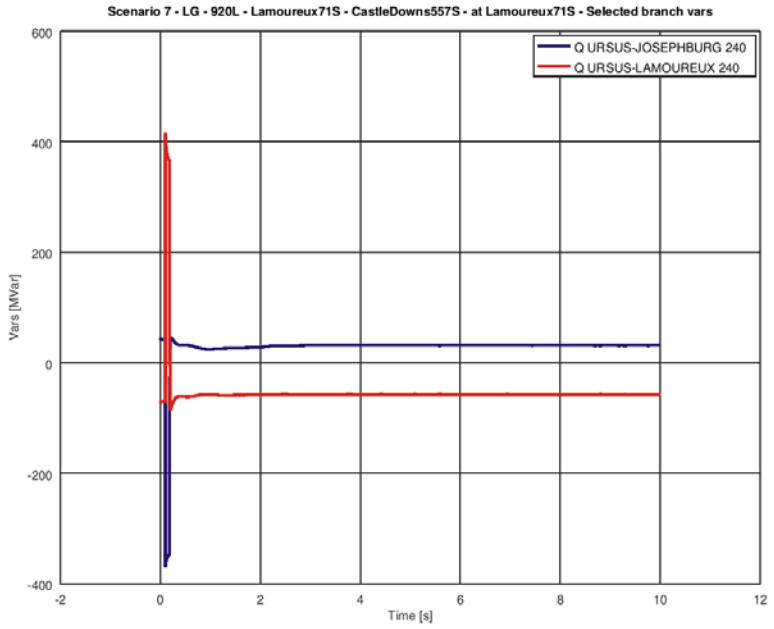


Figure A-616 Scenario 7 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

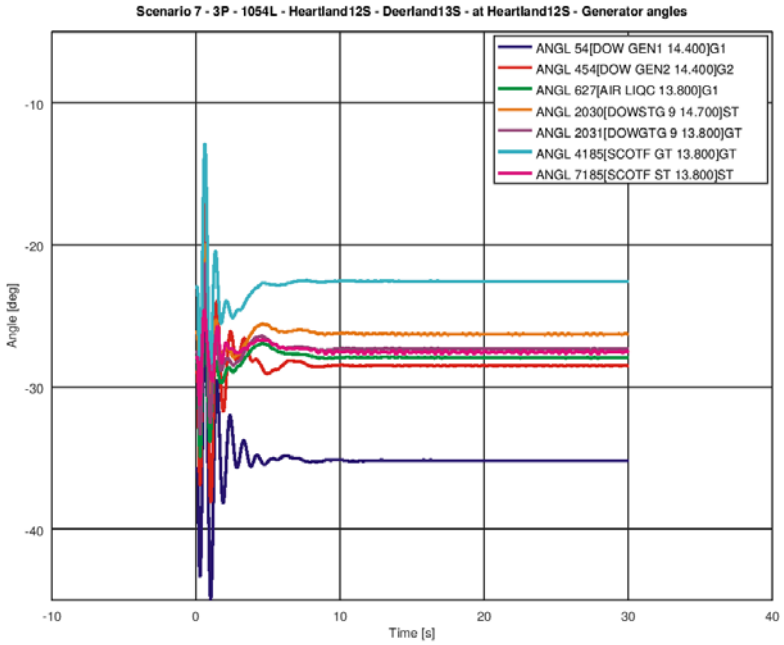


Figure A-617 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

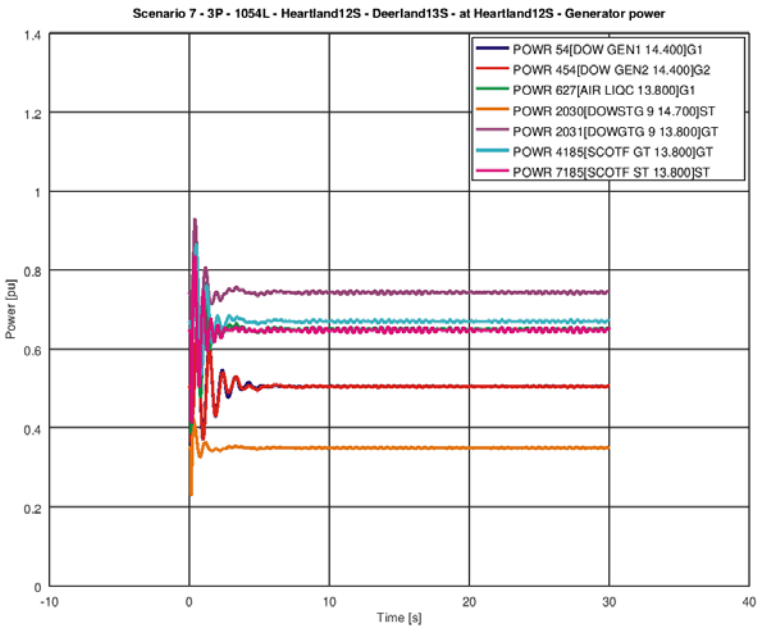


Figure A-618 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

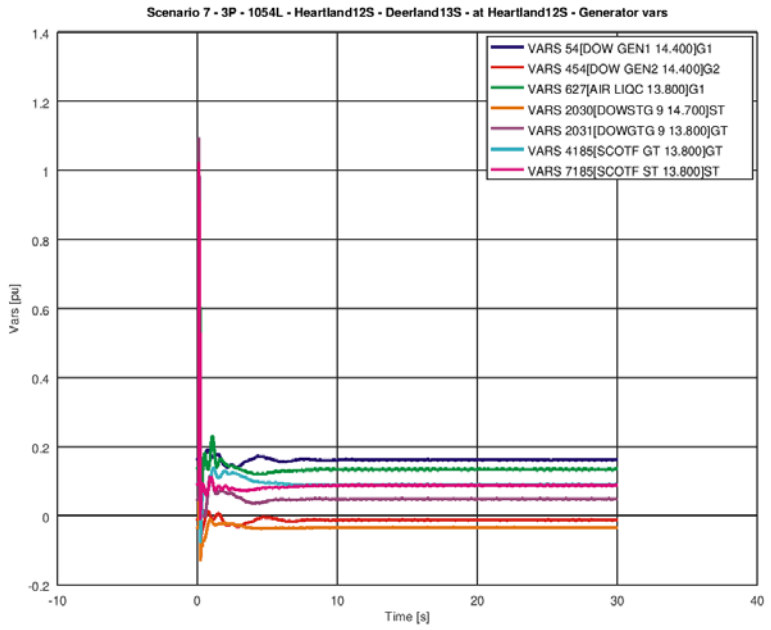


Figure A-619 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

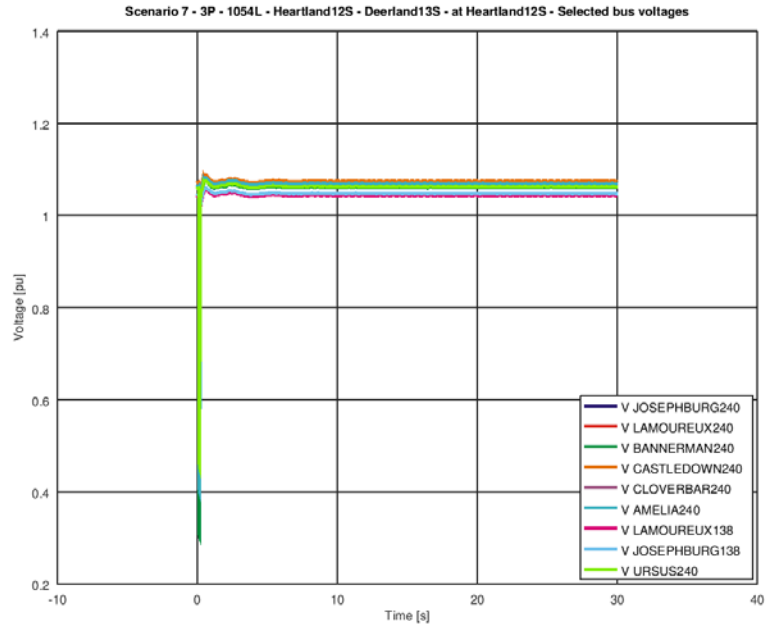


Figure A-620 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

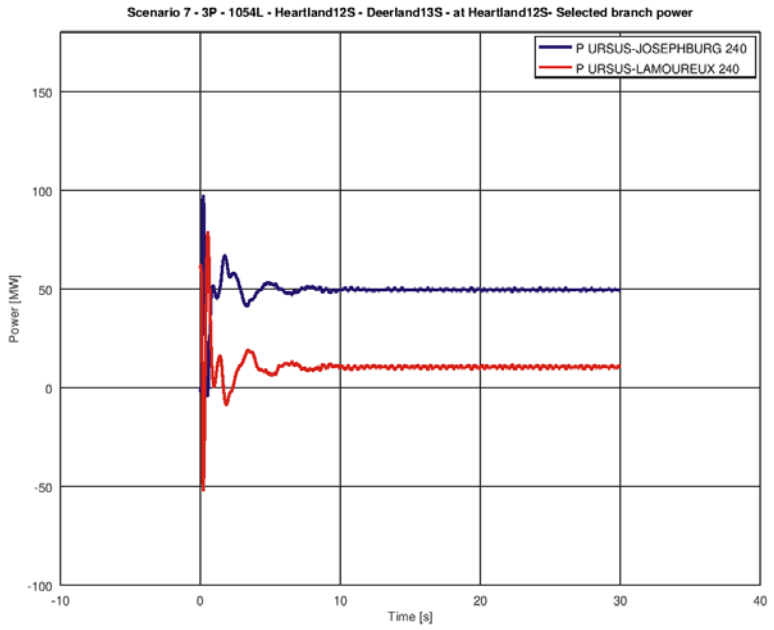


Figure A-621 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

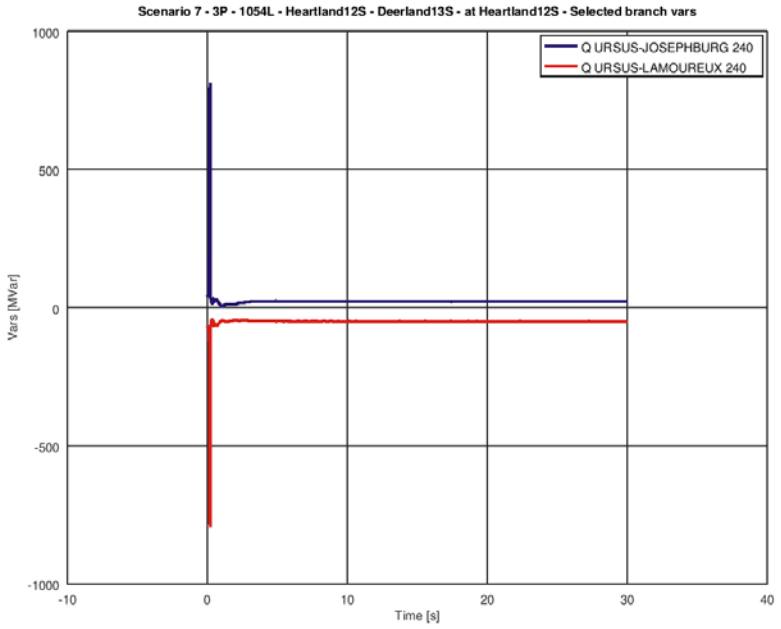


Figure A-622 Scenario 7 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

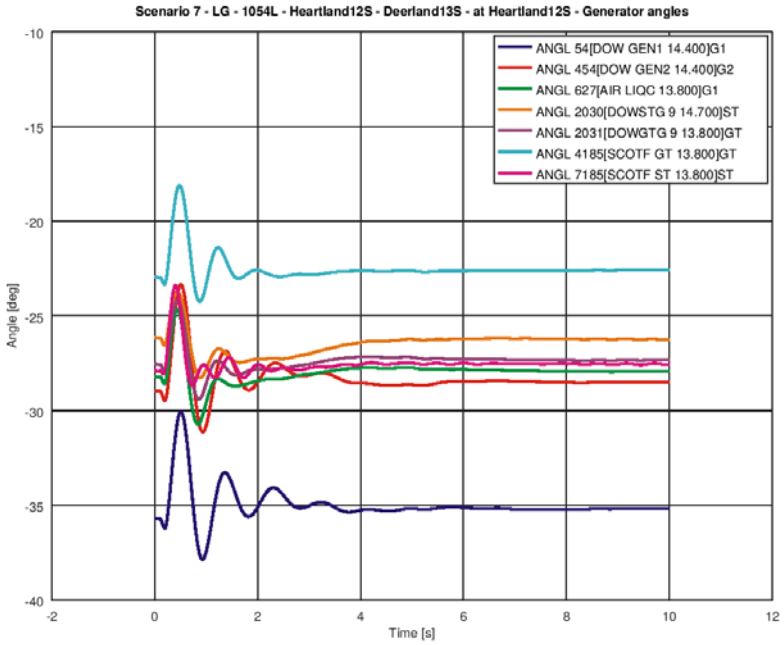


Figure A-623 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

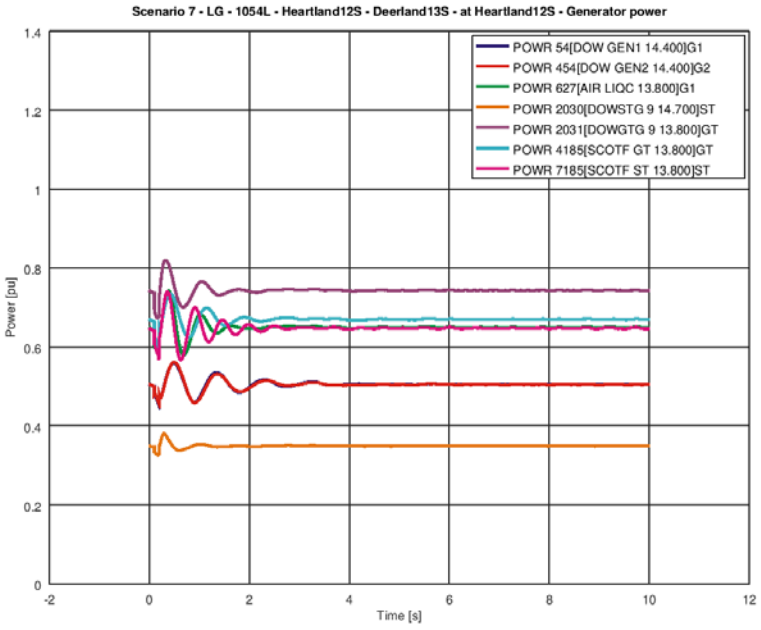


Figure A-624 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

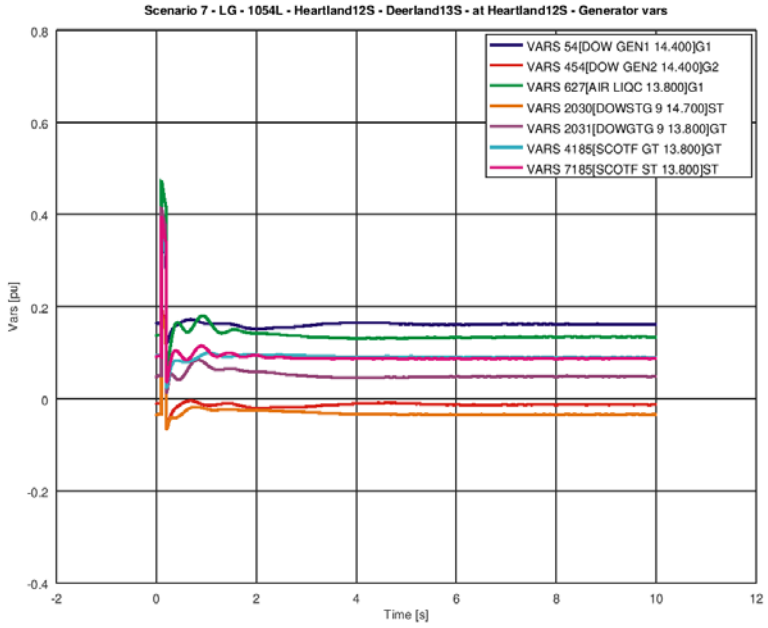


Figure A-625 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

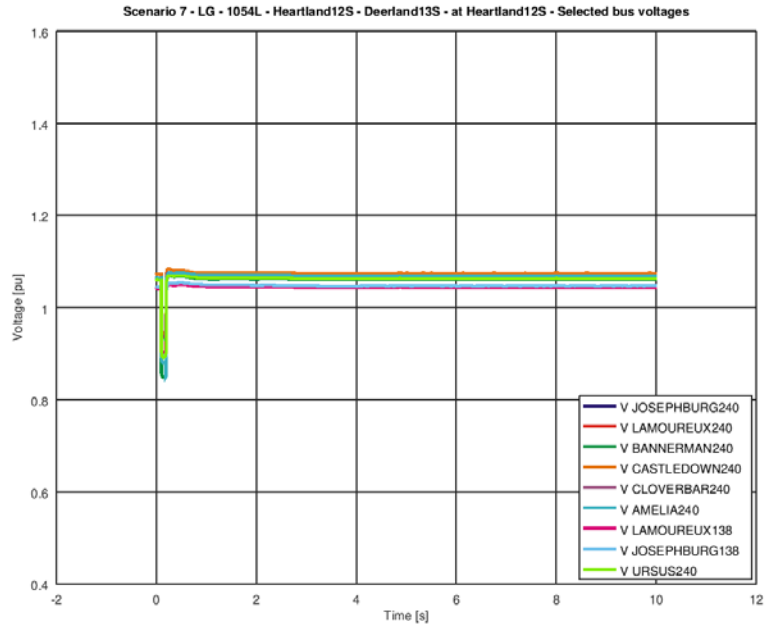


Figure A-626 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

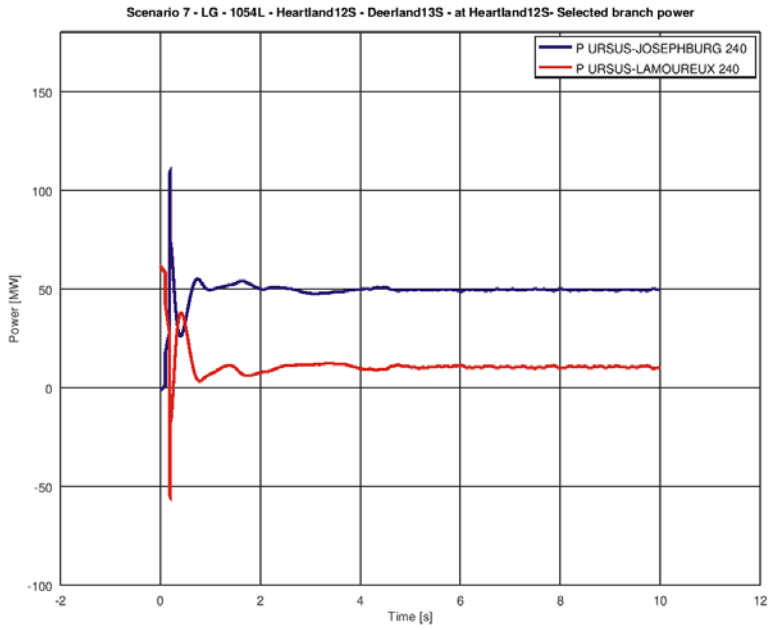


Figure A-627 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

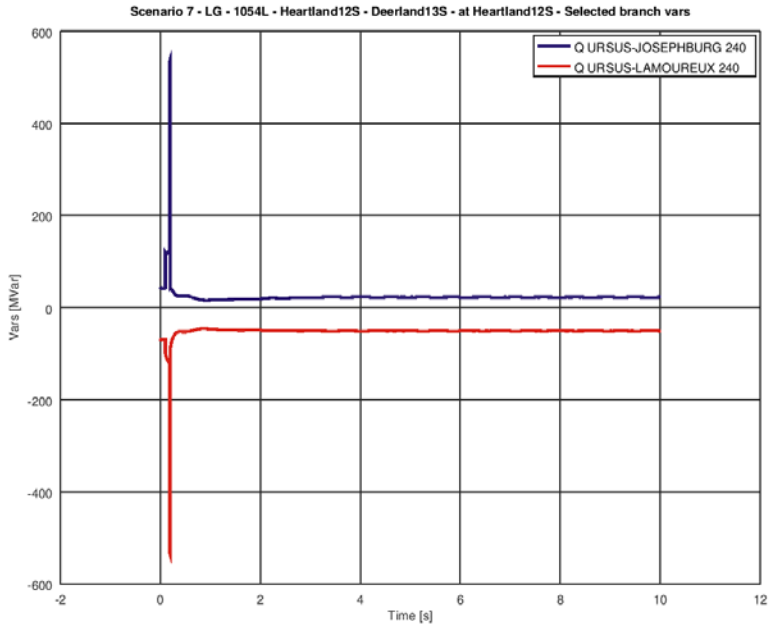


Figure A-628 Scenario 7 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

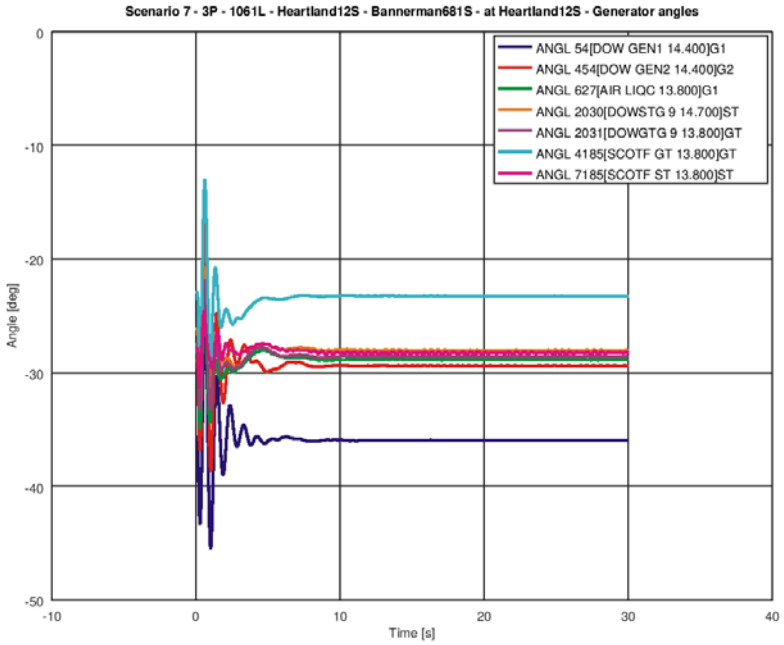


Figure A-629 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

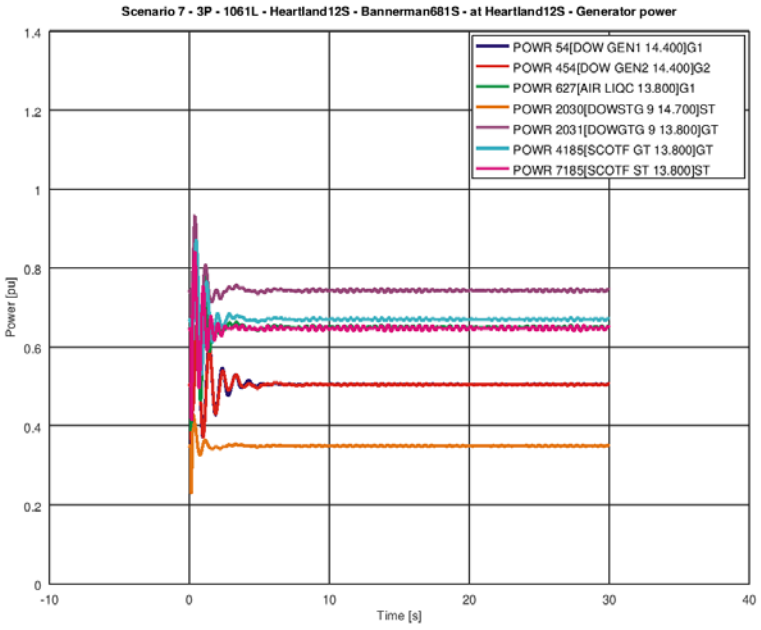


Figure A-630 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

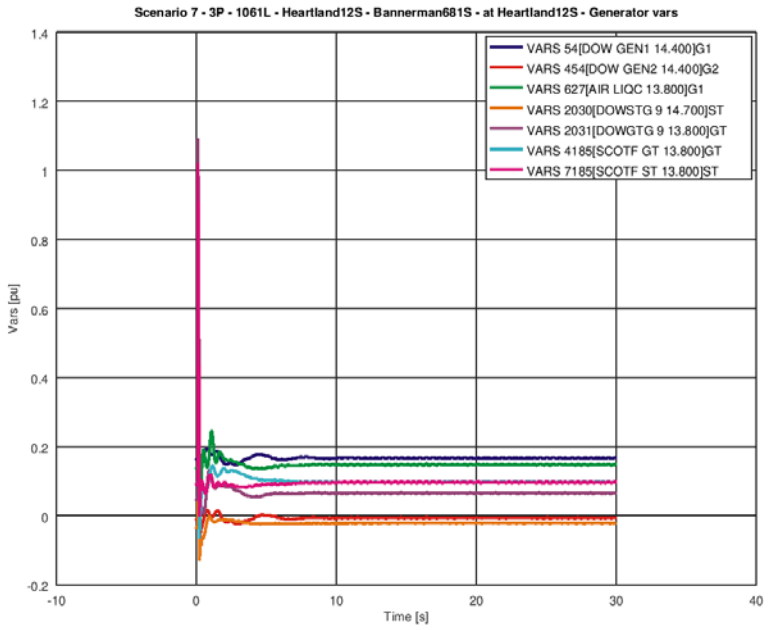


Figure A-631 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

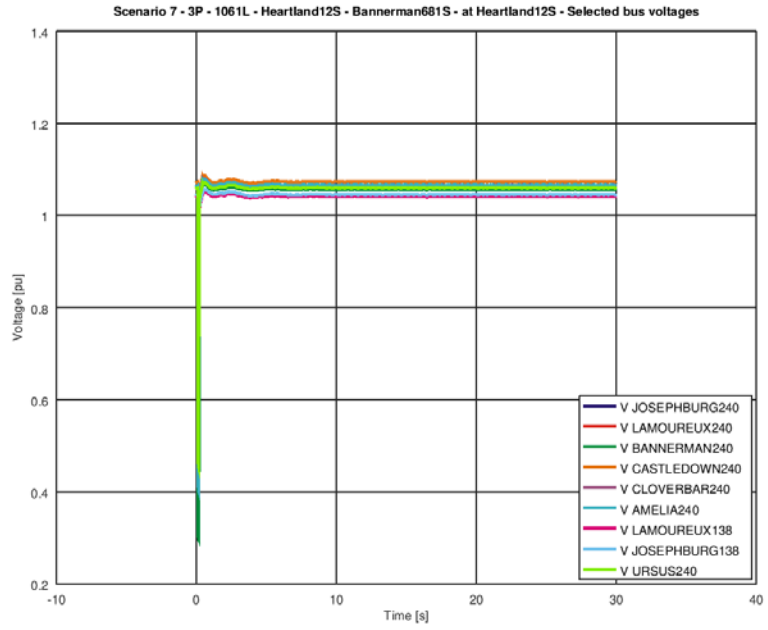


Figure A-632 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

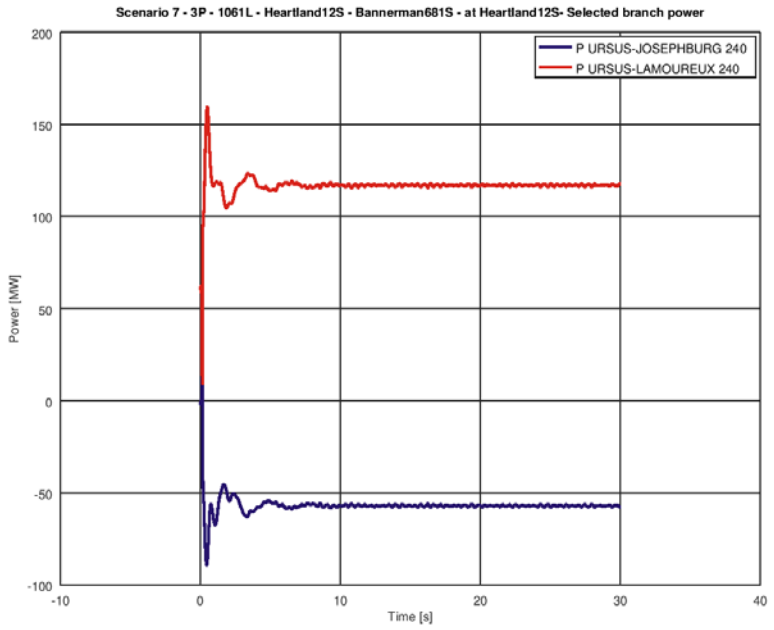


Figure A-633 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

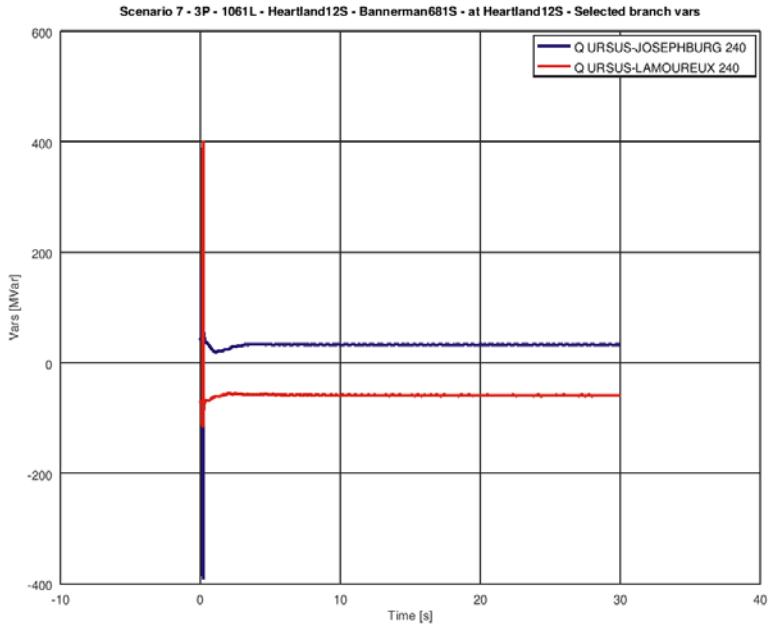


Figure A-634 Scenario 7 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

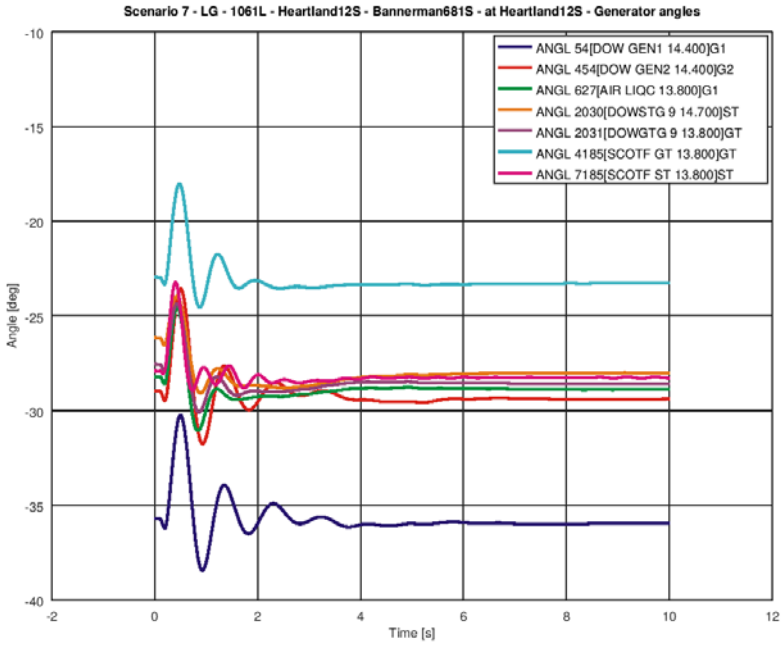


Figure A-635 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

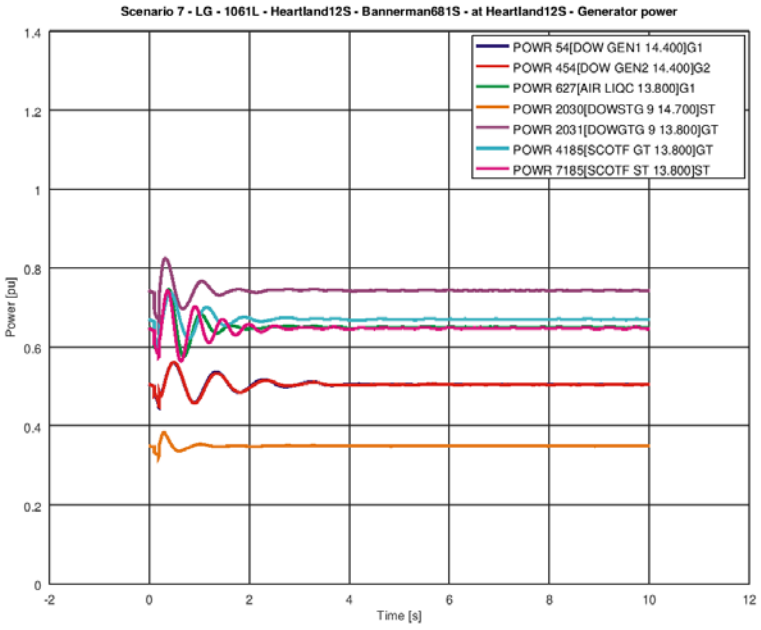


Figure A-636 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

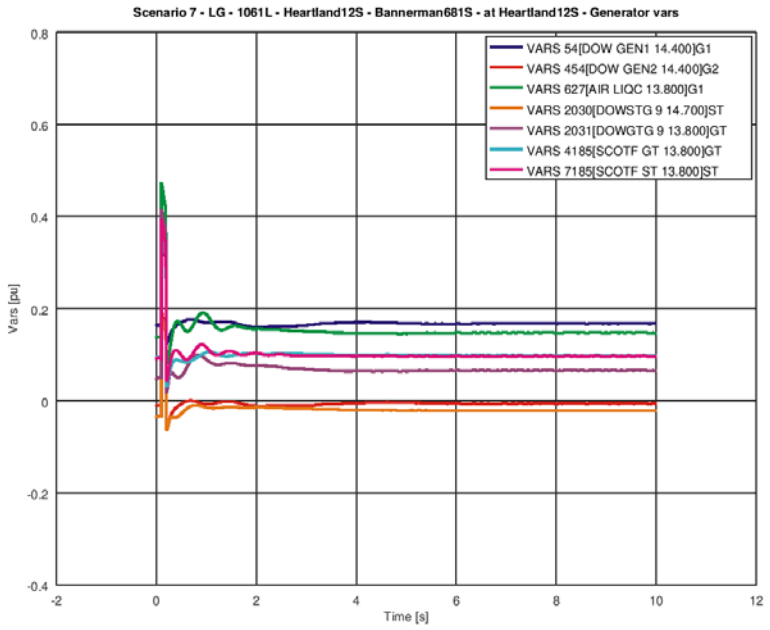


Figure A-637 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

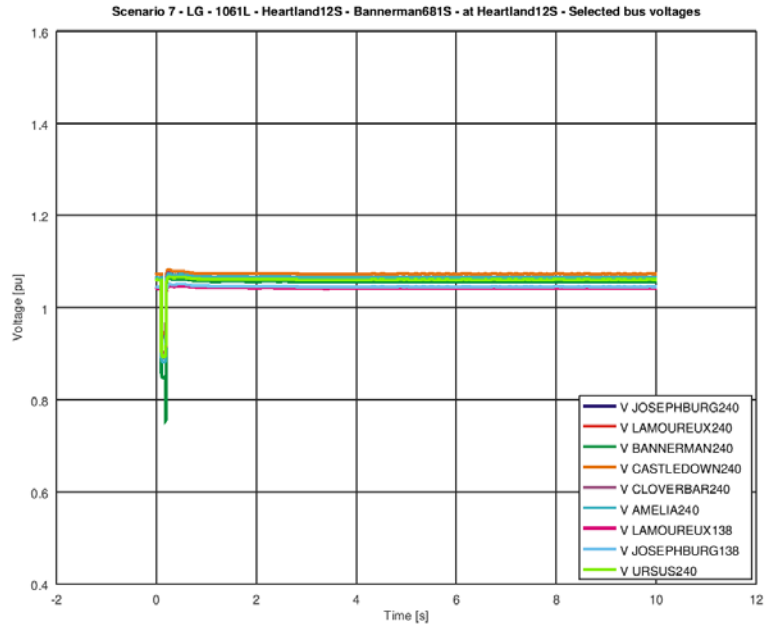


Figure A-638 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

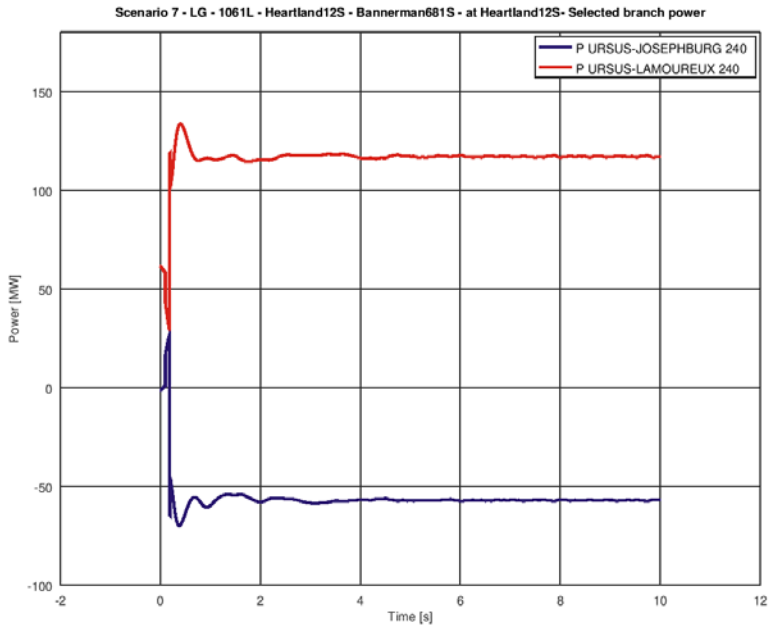


Figure A-639 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

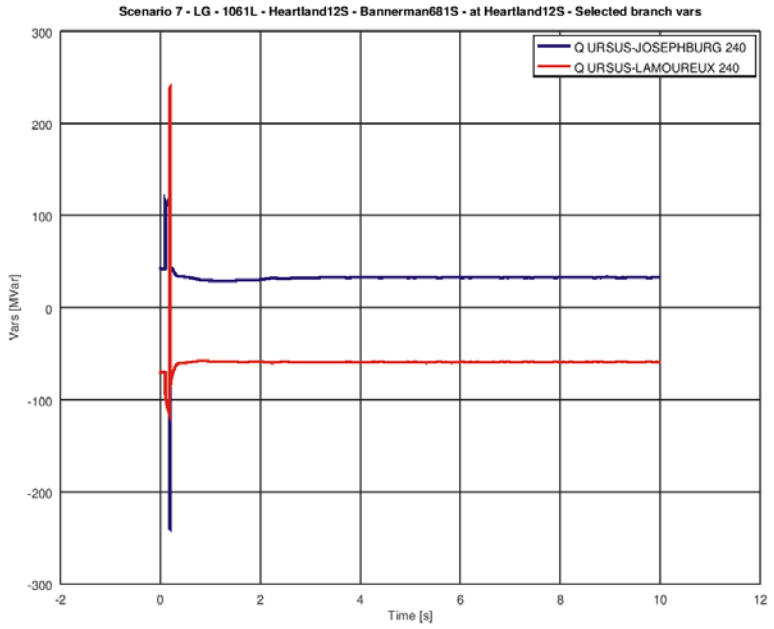


Figure A-640 Scenario 7 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

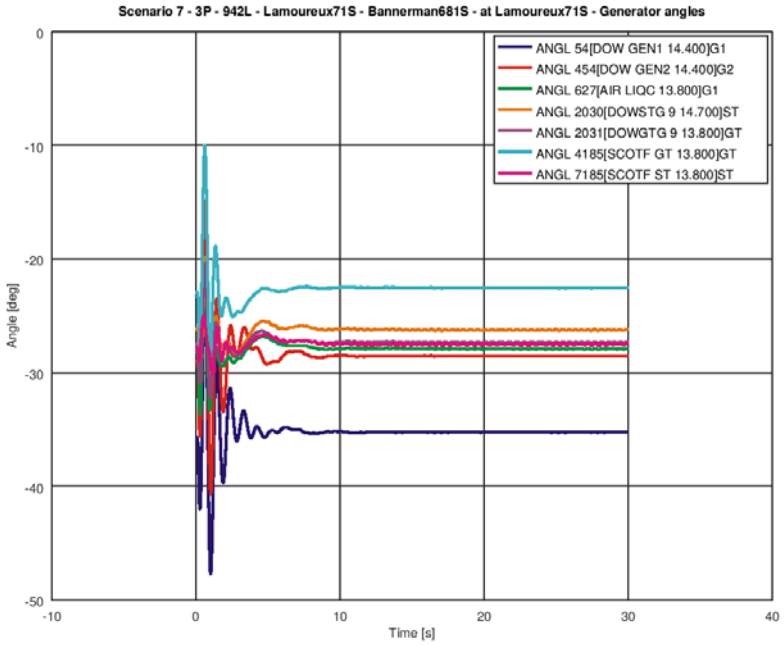


Figure A-641 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

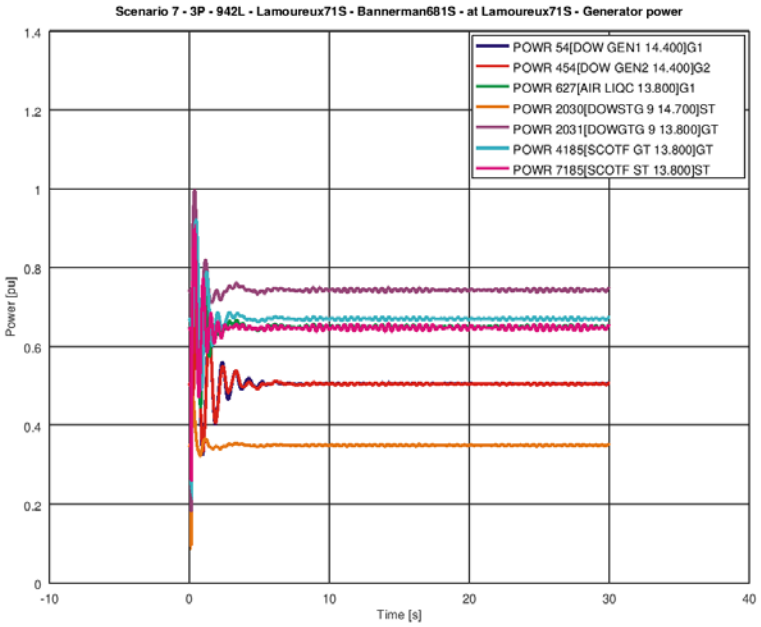


Figure A-642 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

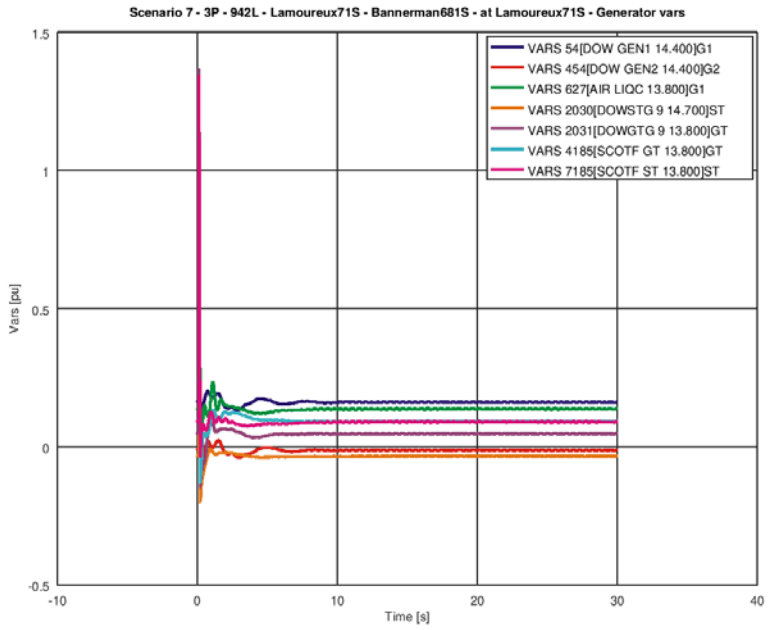


Figure A-643 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

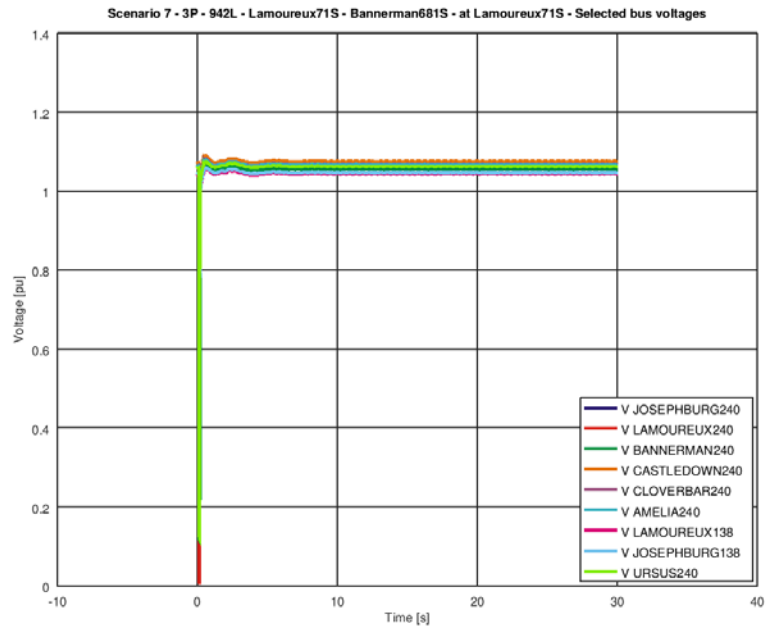


Figure A-644 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

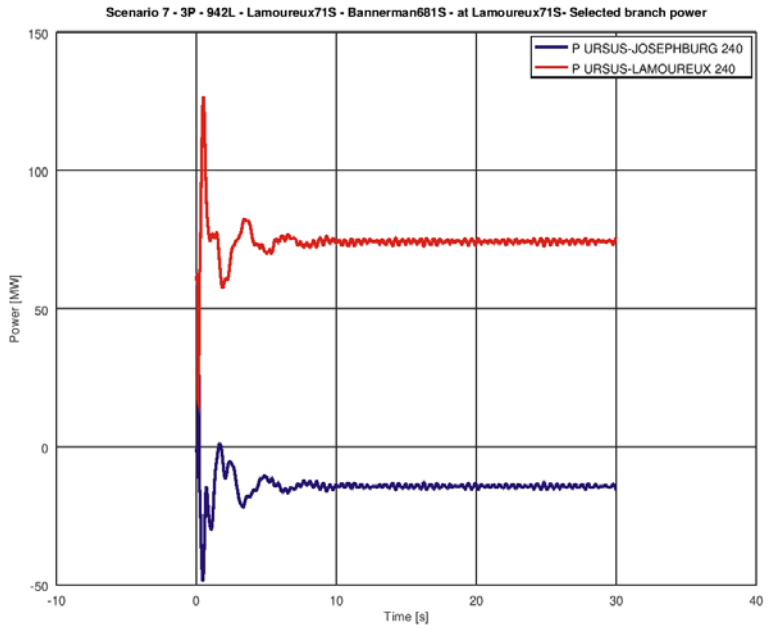


Figure A-645 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

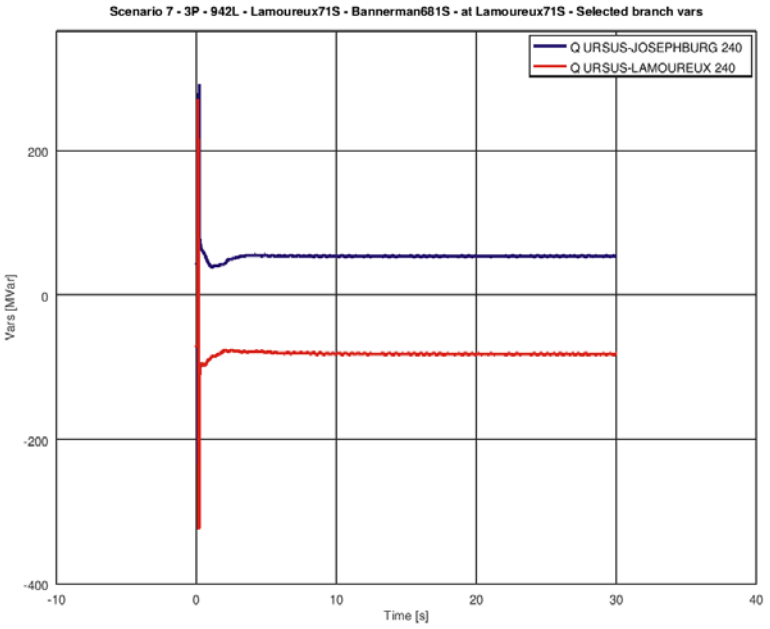


Figure A-646 Scenario 7 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

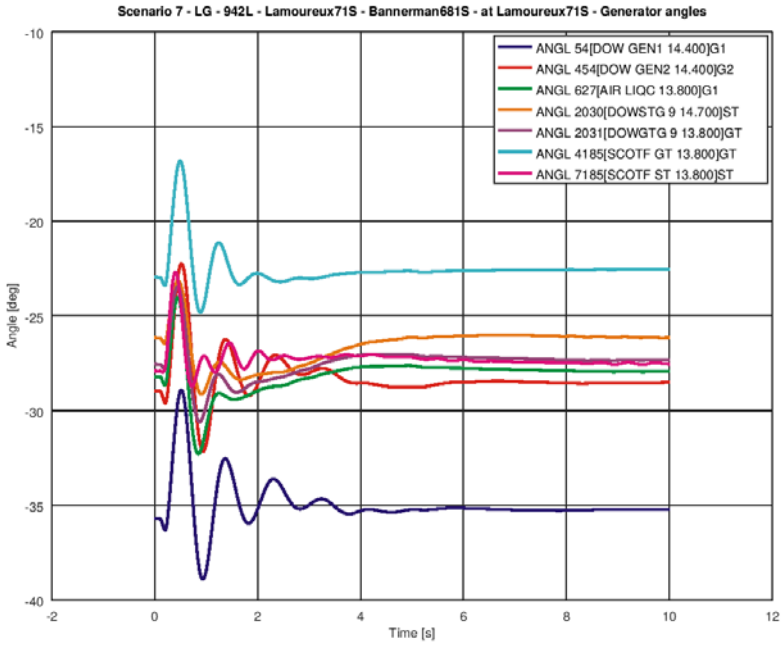


Figure A-647 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

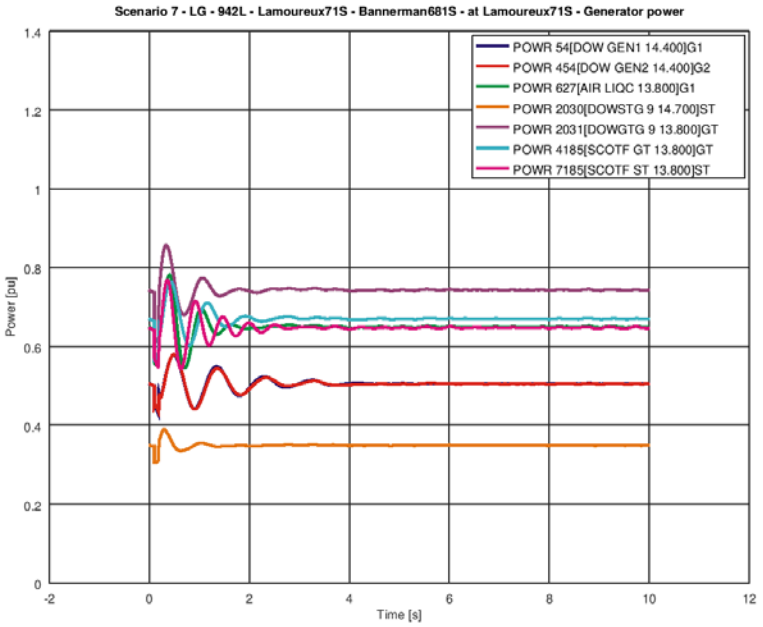


Figure A-648 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

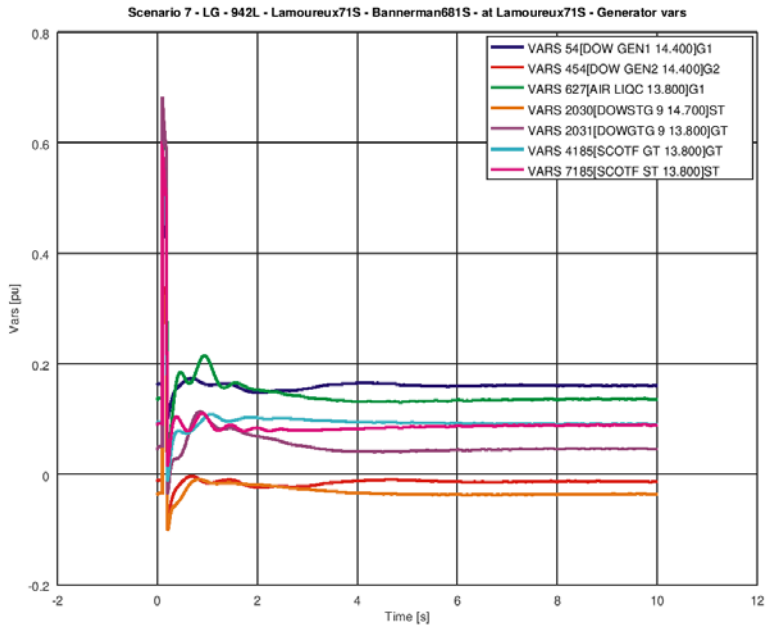


Figure A-649 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

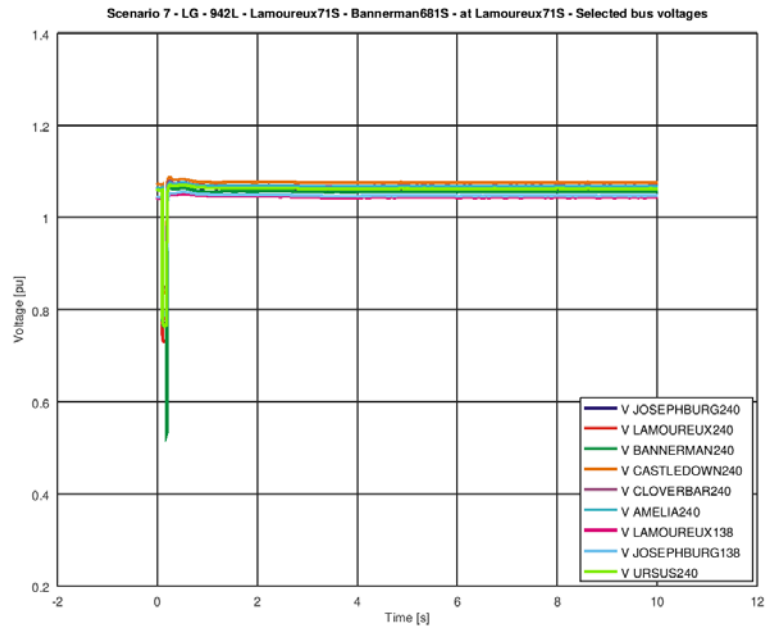


Figure A-650 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

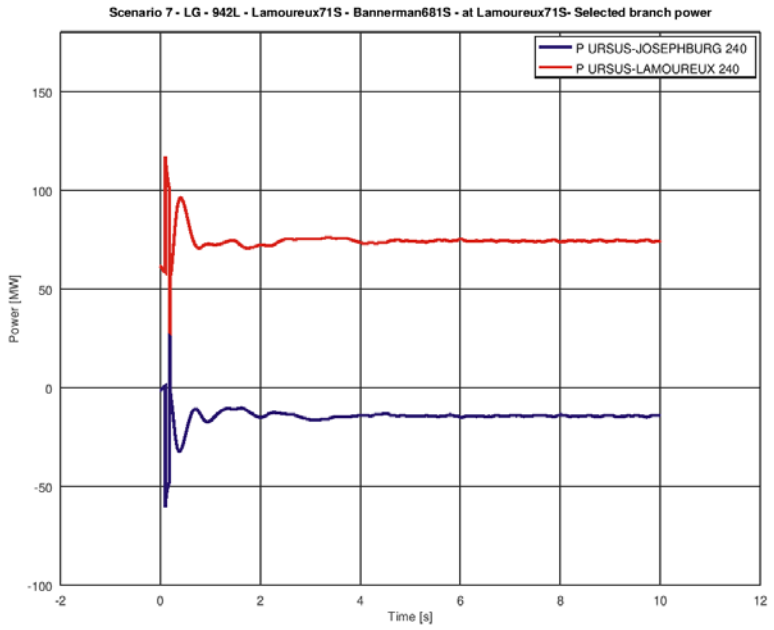


Figure A-651 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

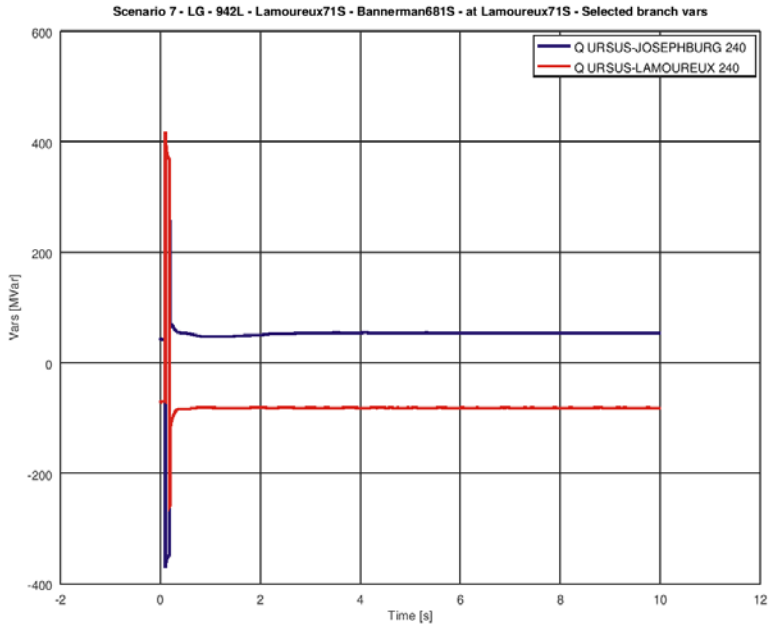


Figure A-652 Scenario 7 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

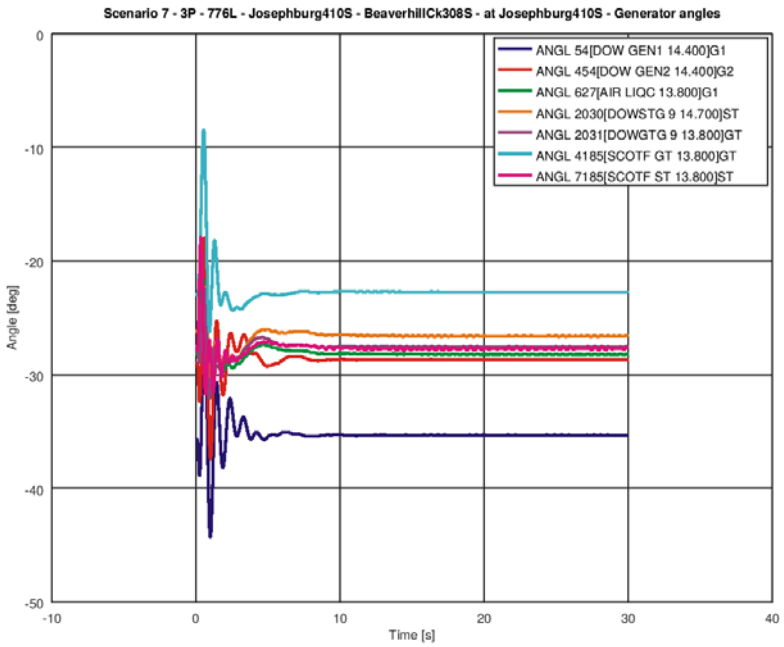


Figure A-653 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

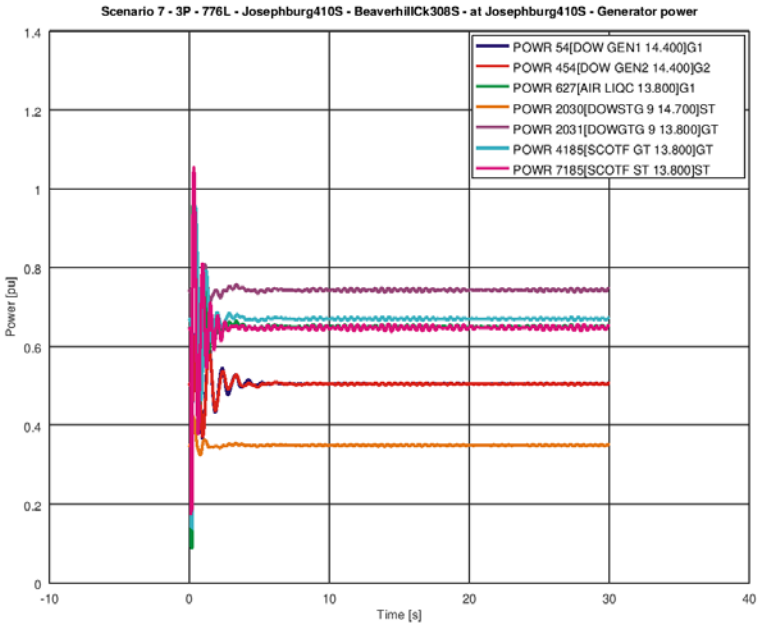


Figure A-654 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

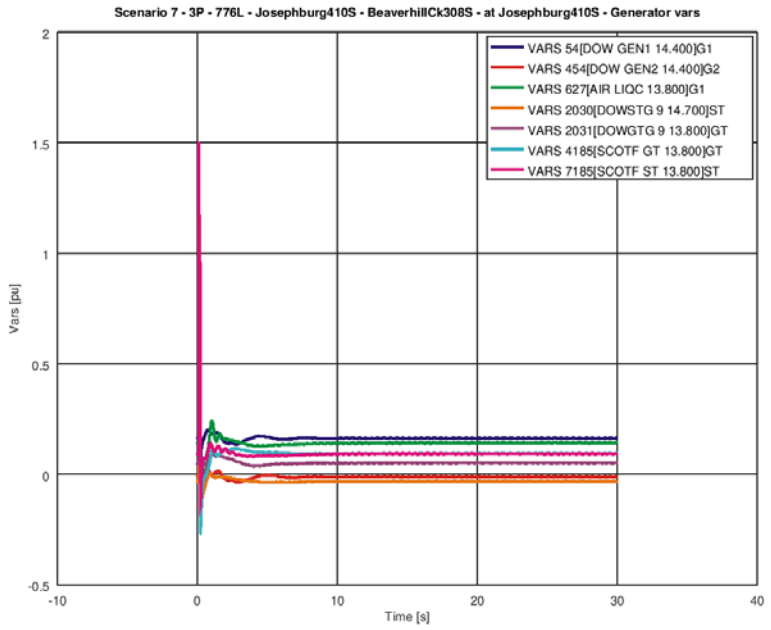


Figure A-655 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

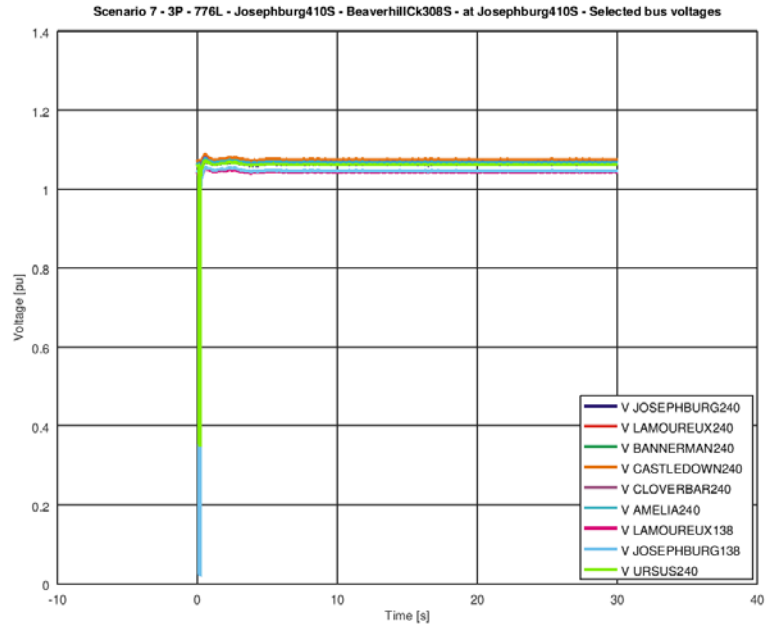


Figure A-656 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

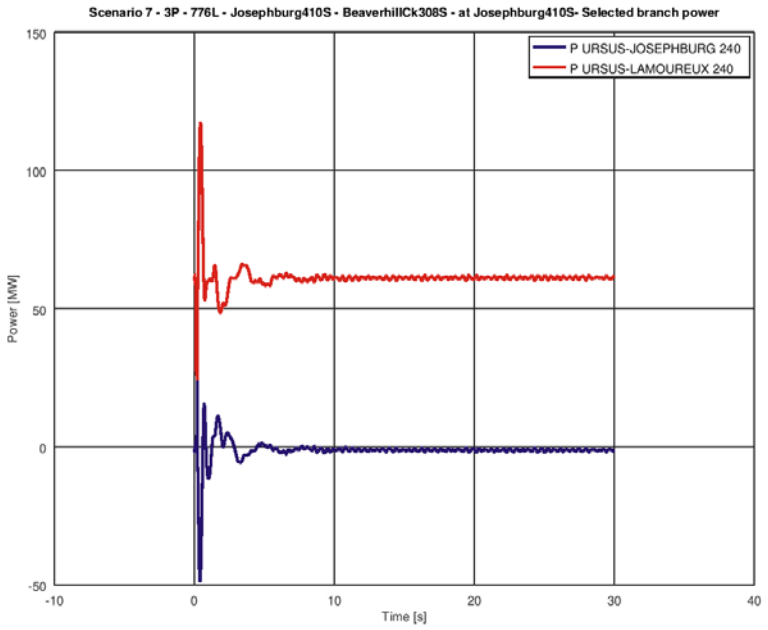


Figure A-657 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

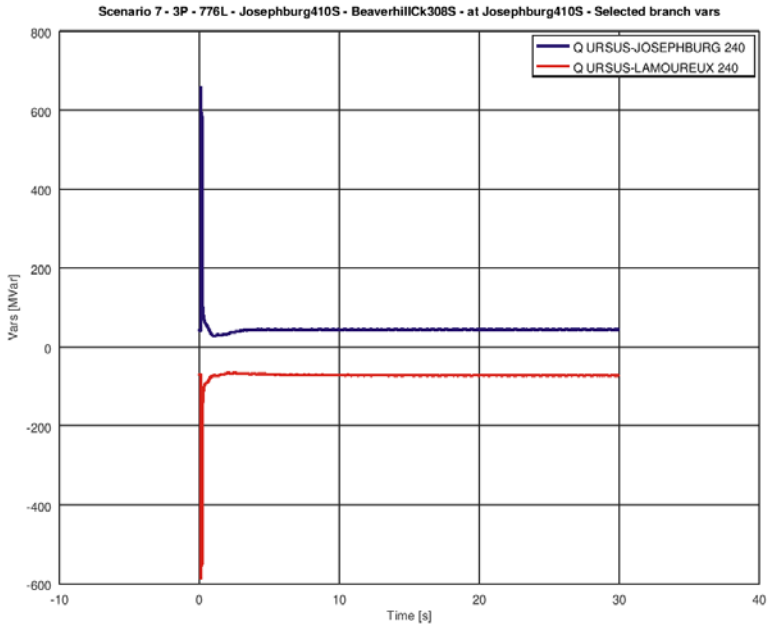


Figure A-658 Scenario 7 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

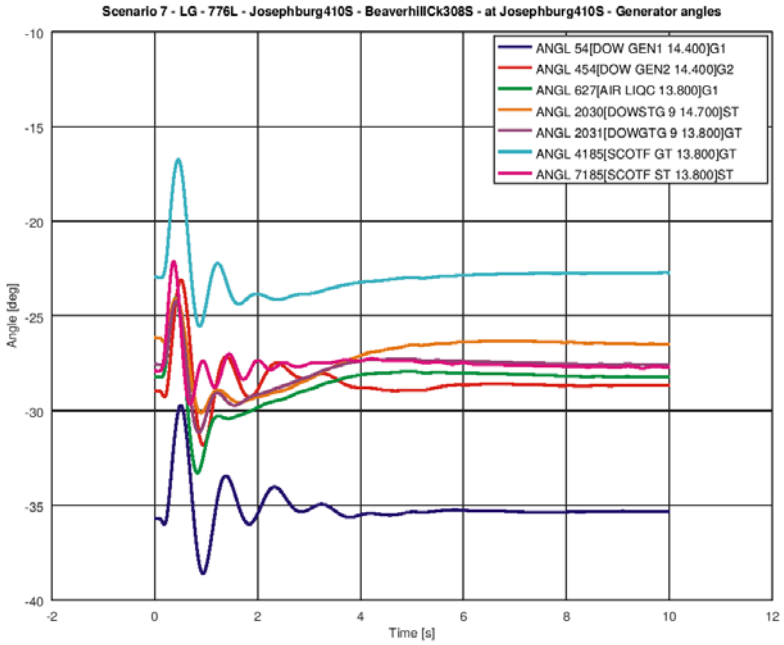


Figure A-659 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

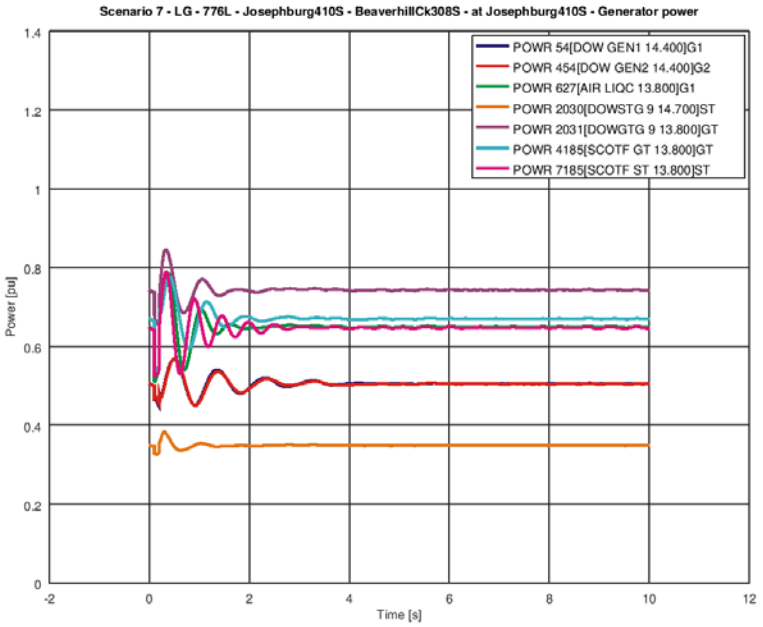


Figure A-660 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

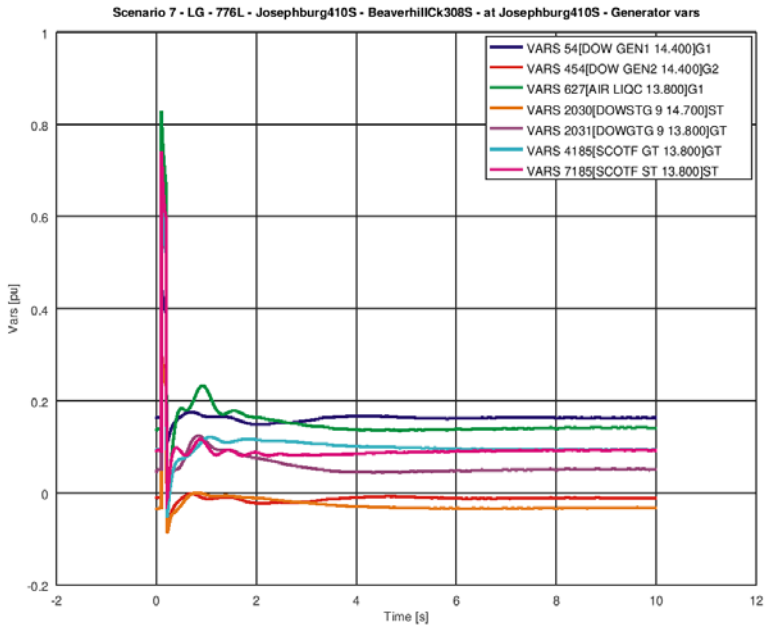


Figure A-661 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

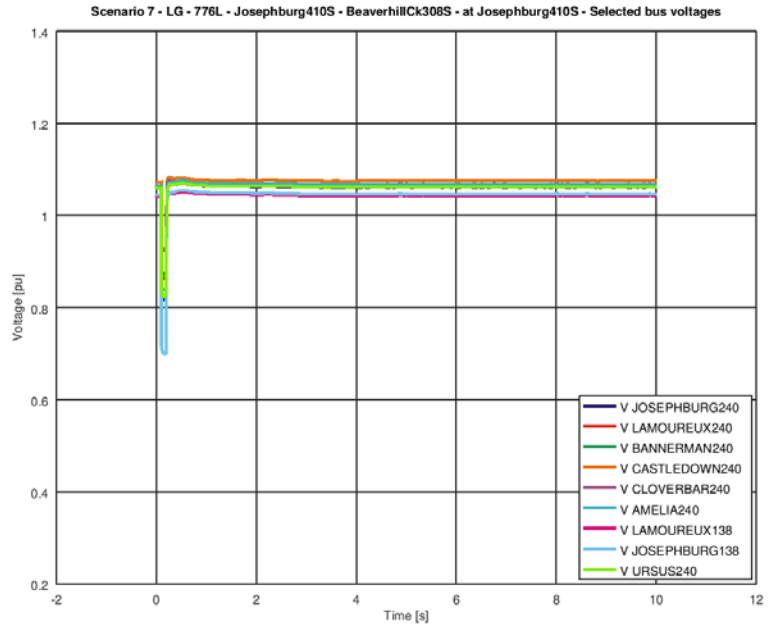


Figure A-662 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

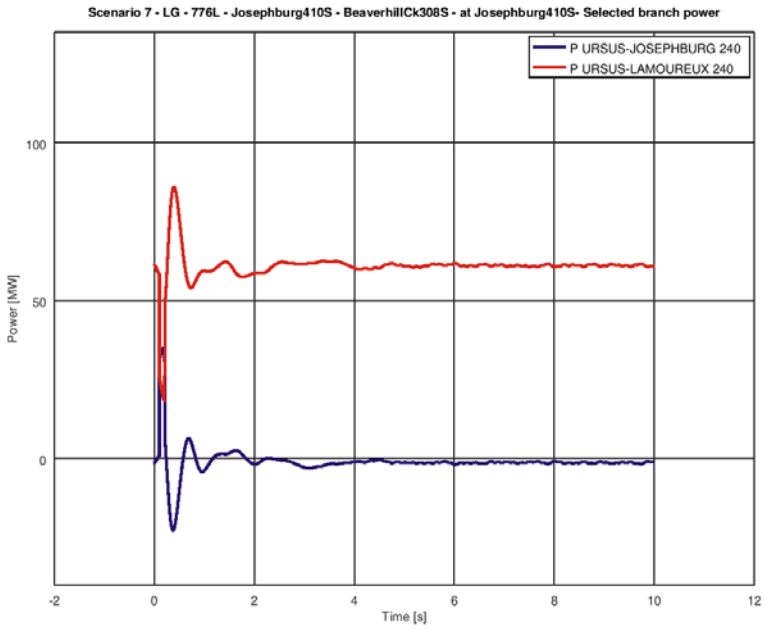


Figure A-663 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

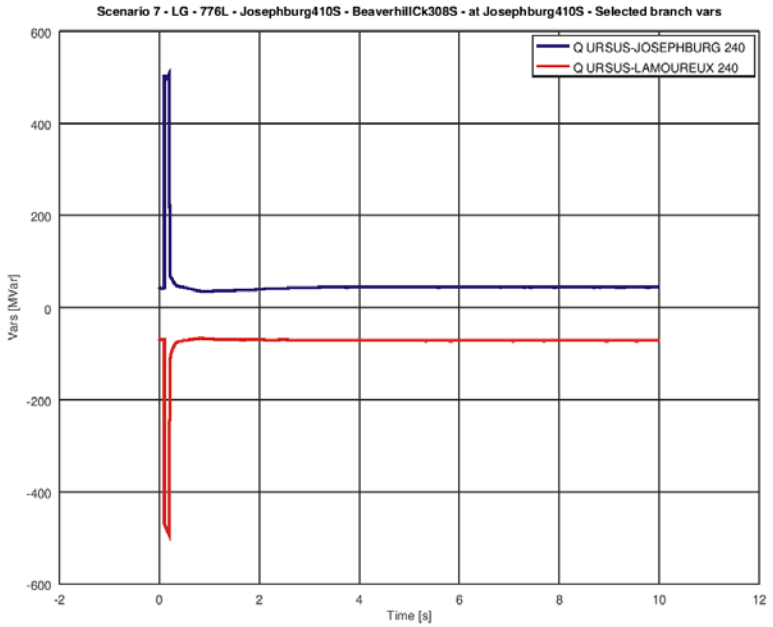


Figure A-664 Scenario 7 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

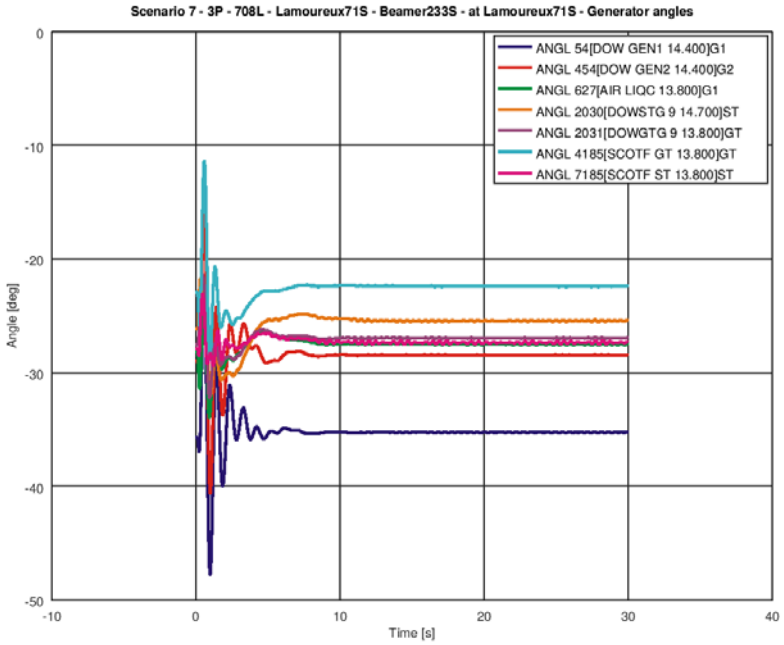


Figure A-665 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

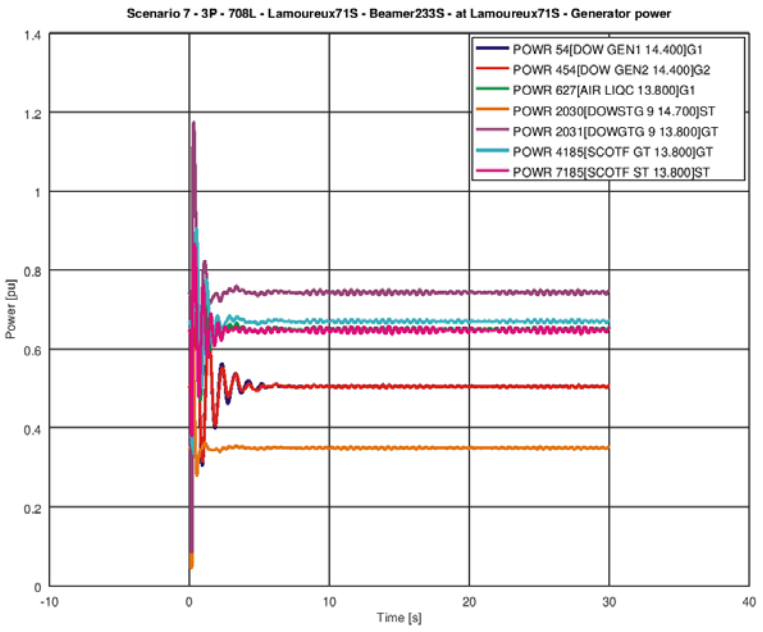


Figure A-666 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

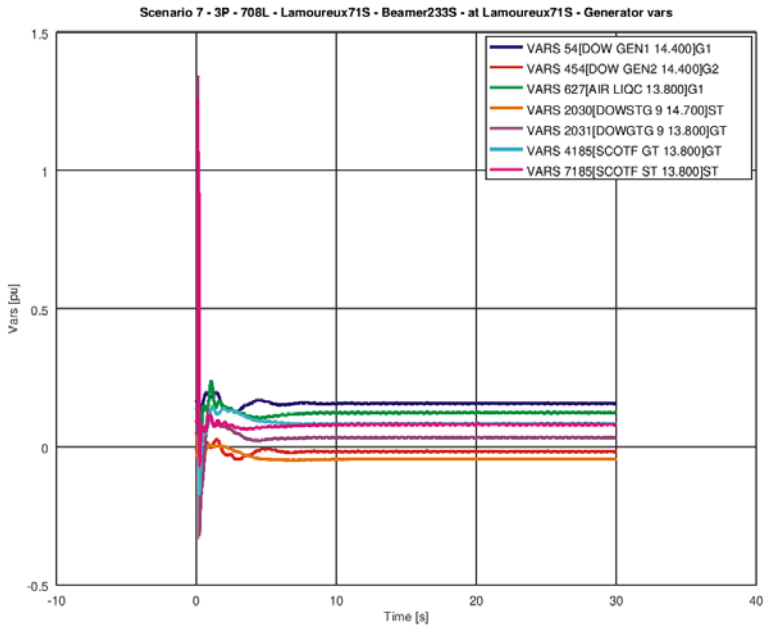


Figure A-667 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

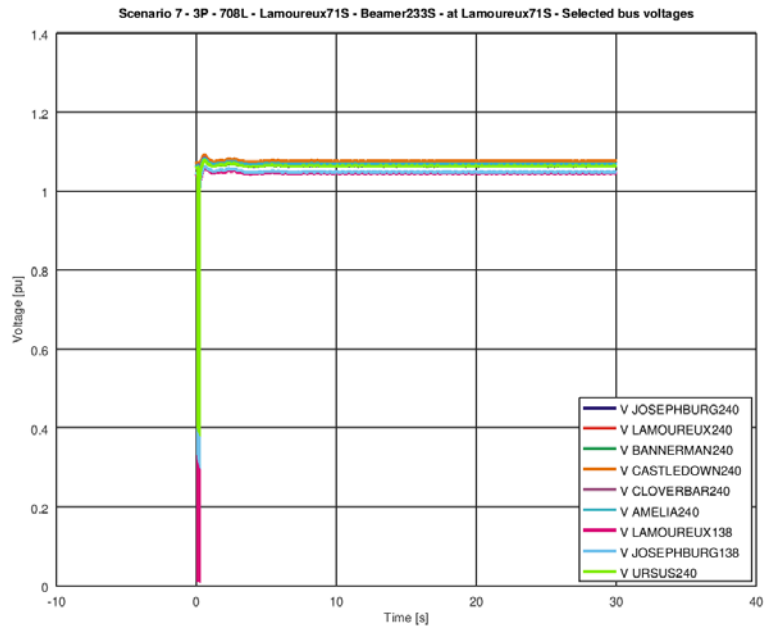


Figure A-668 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

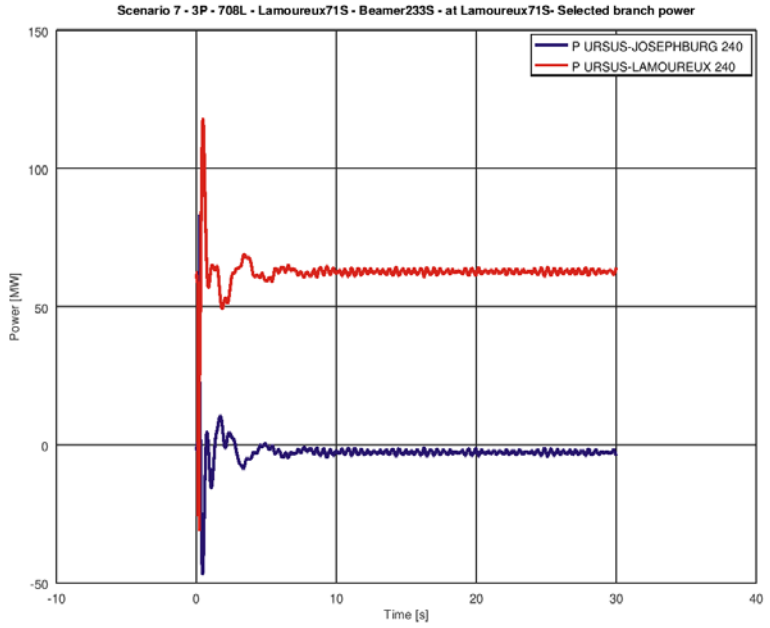


Figure A-669 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

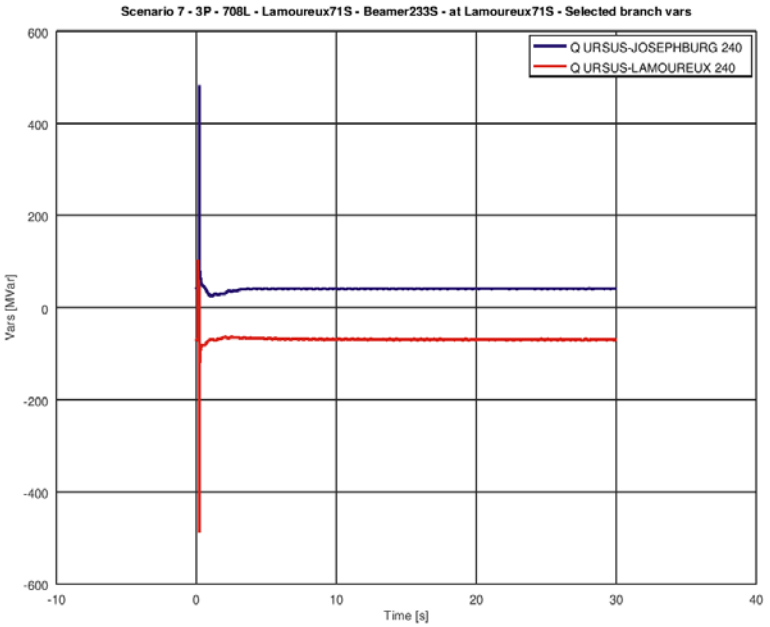


Figure A-670 Scenario 7 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

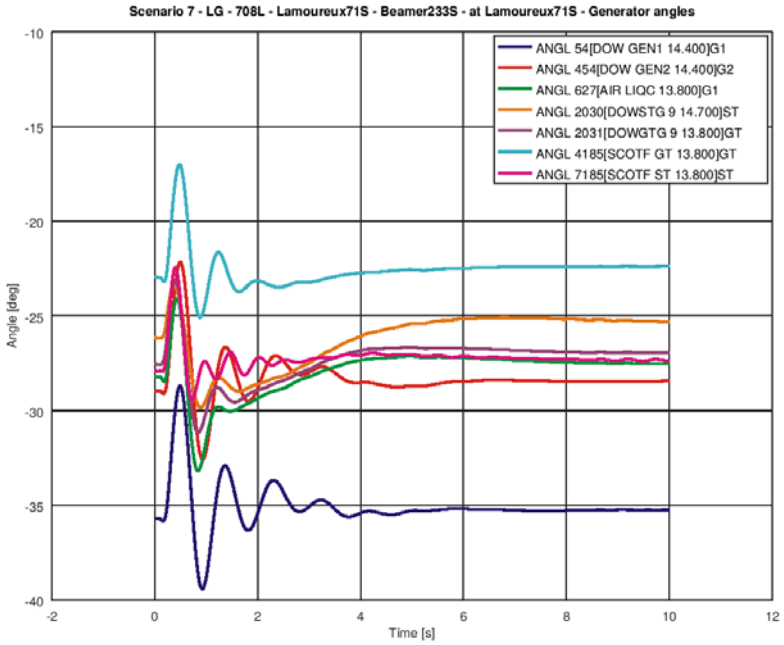


Figure A-671 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

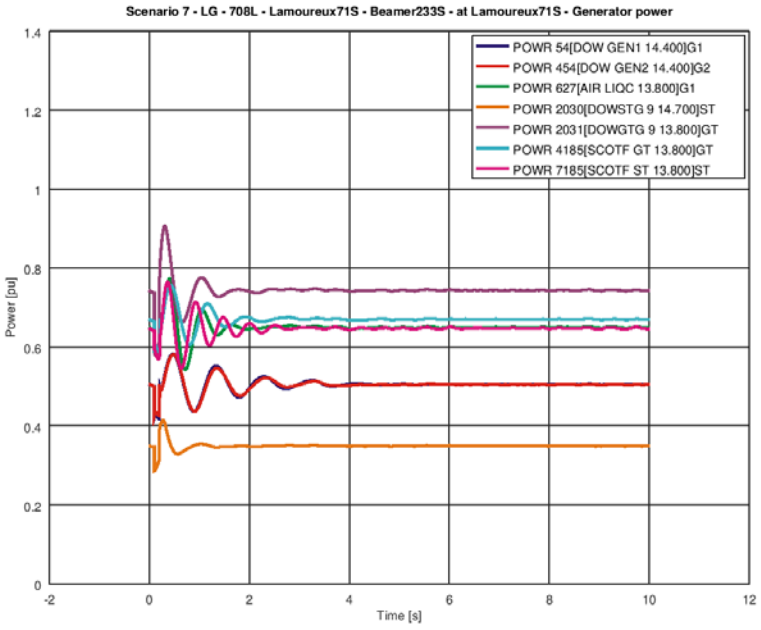


Figure A-672 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

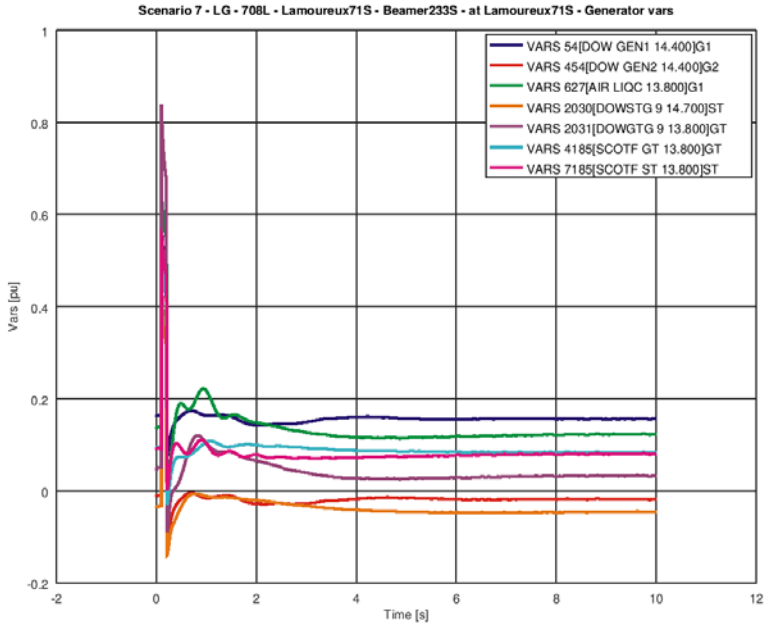


Figure A-673 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

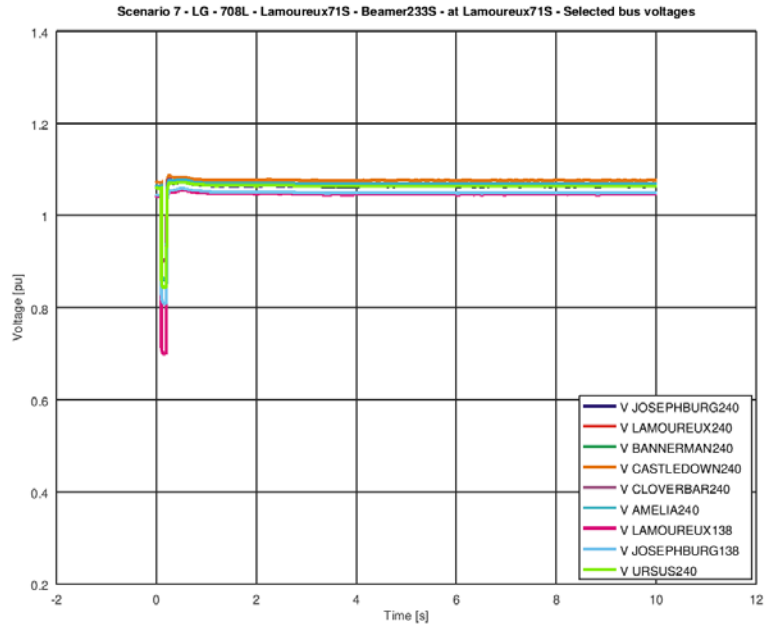


Figure A-674 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

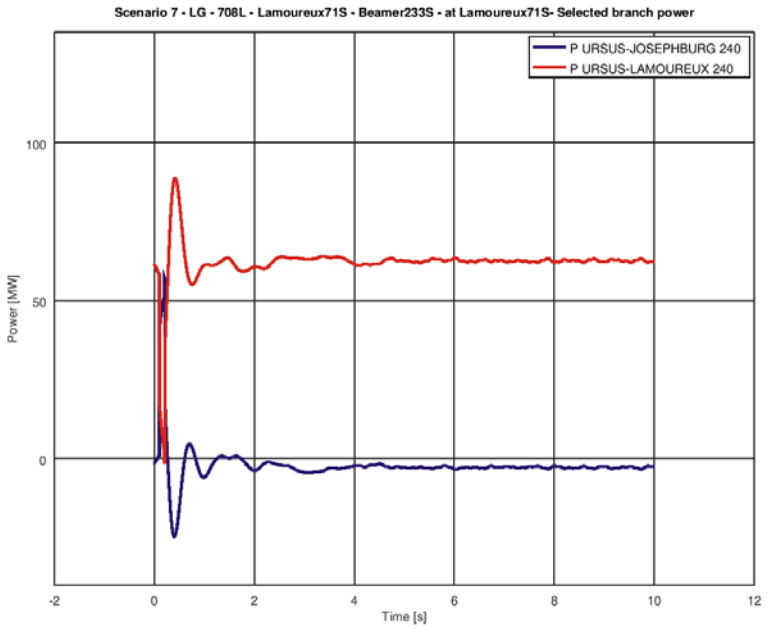


Figure A-675 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

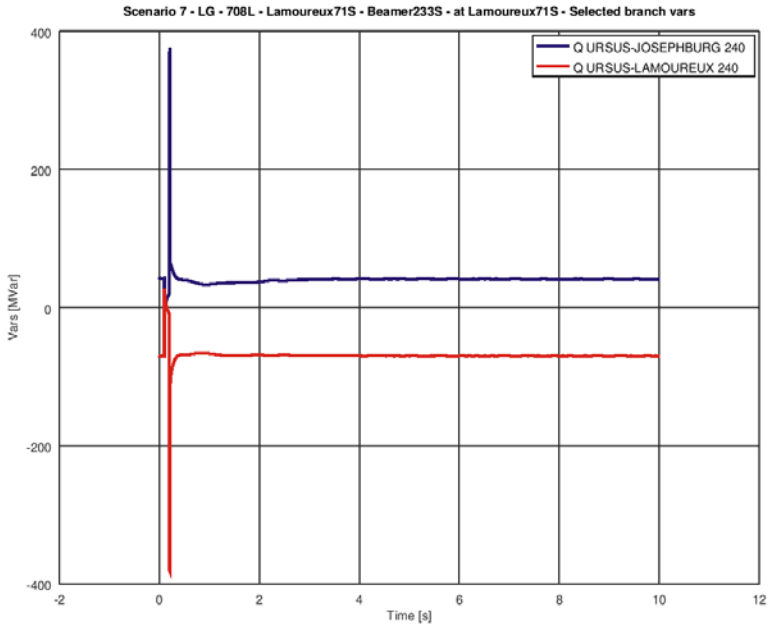


Figure A-676 Scenario 7 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

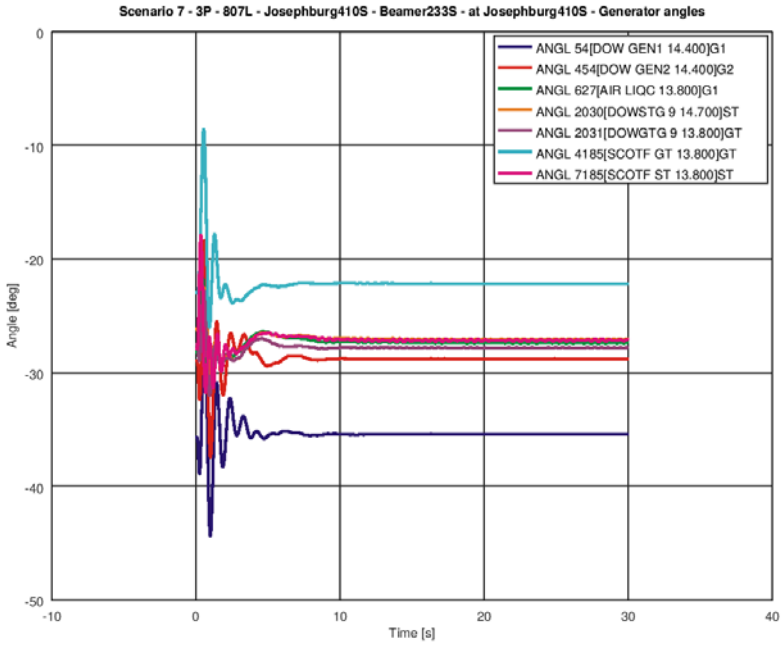


Figure A-677 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

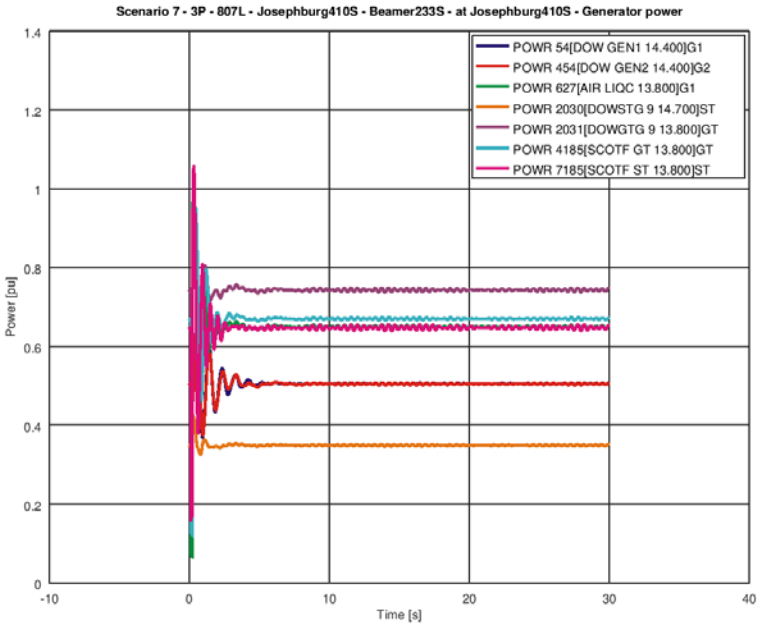


Figure A-678 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

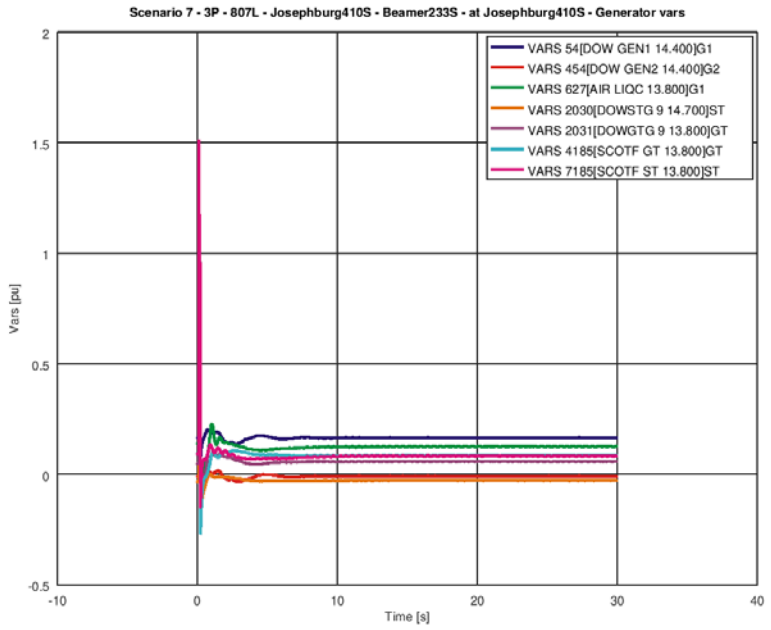


Figure A-679 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

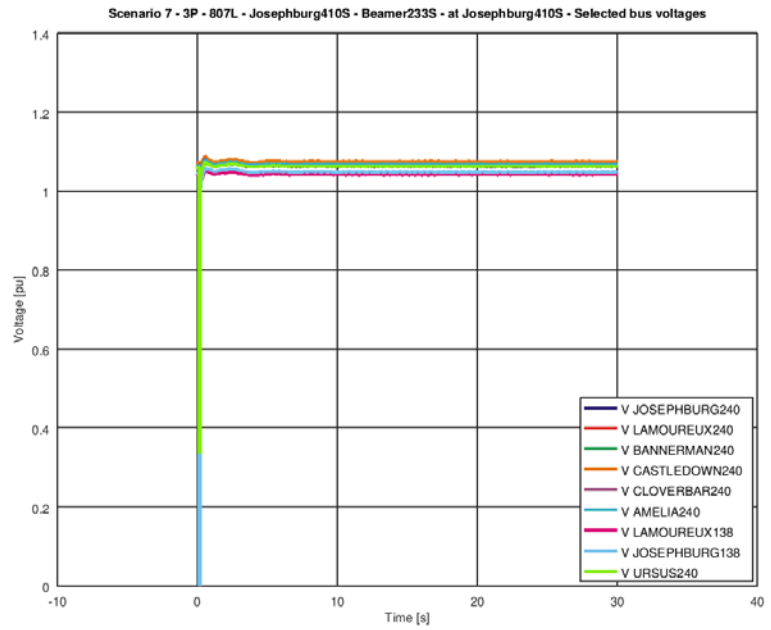


Figure A-680 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

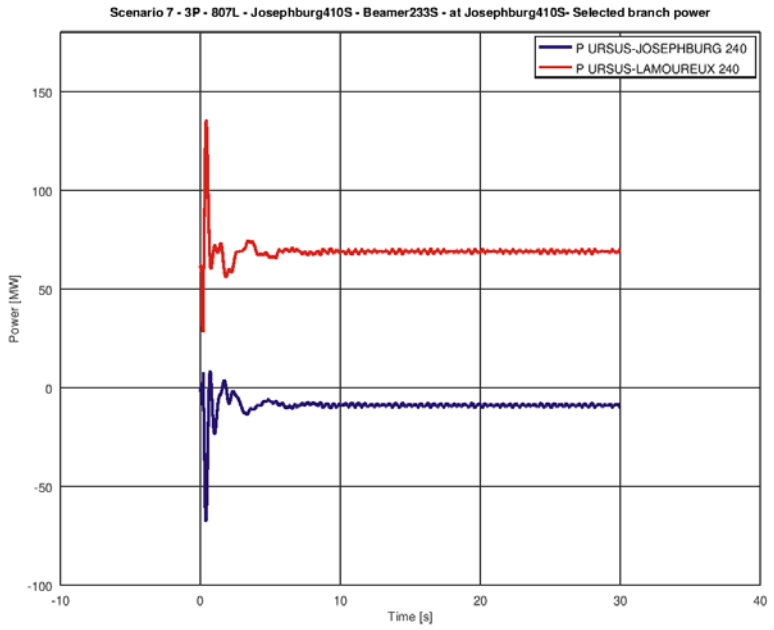


Figure A-681 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

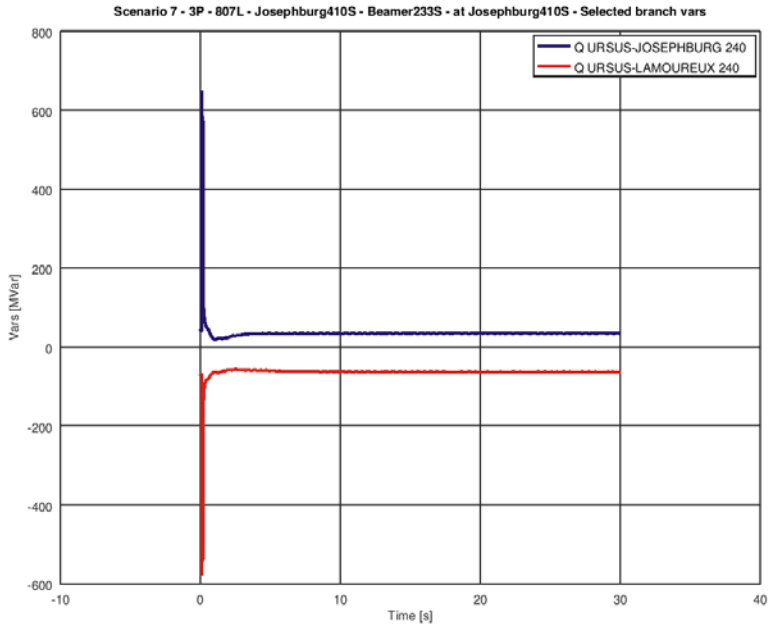


Figure A-682 Scenario 7 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

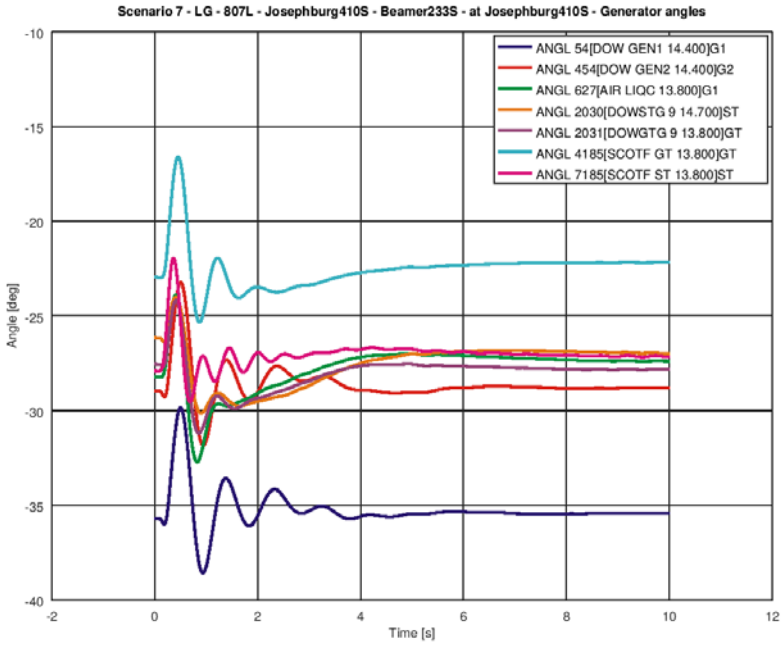


Figure A-683 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

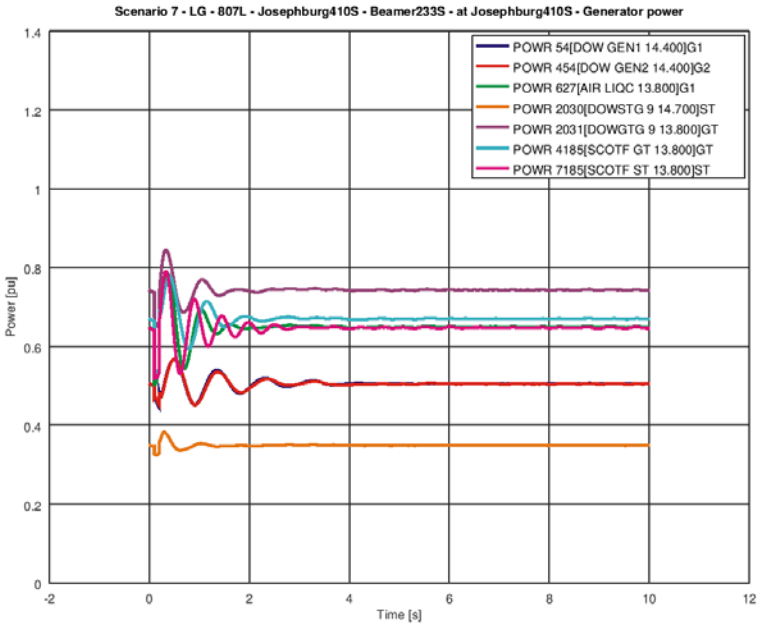


Figure A-684 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

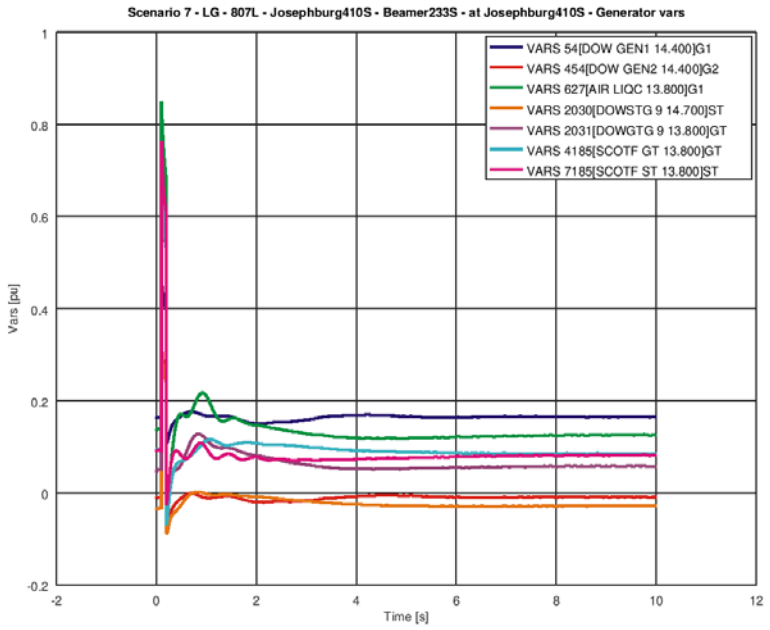


Figure A-685 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

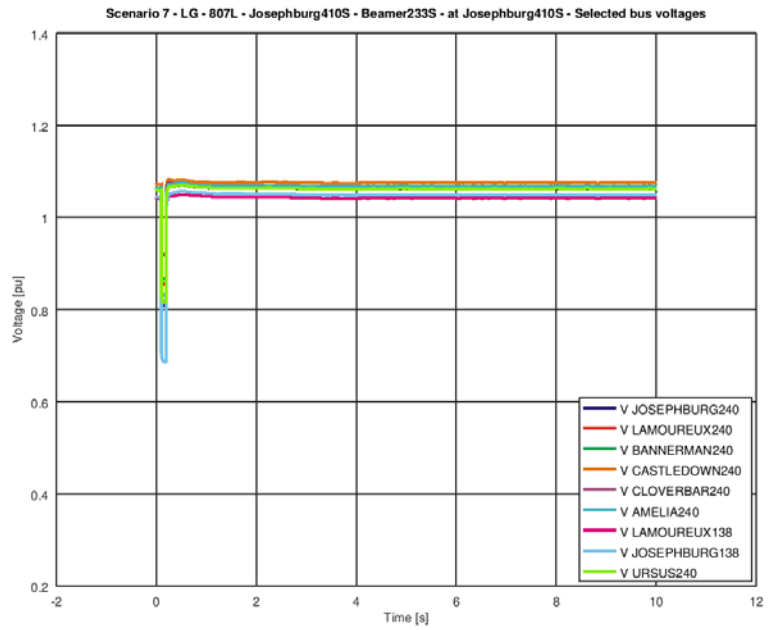


Figure A-686 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

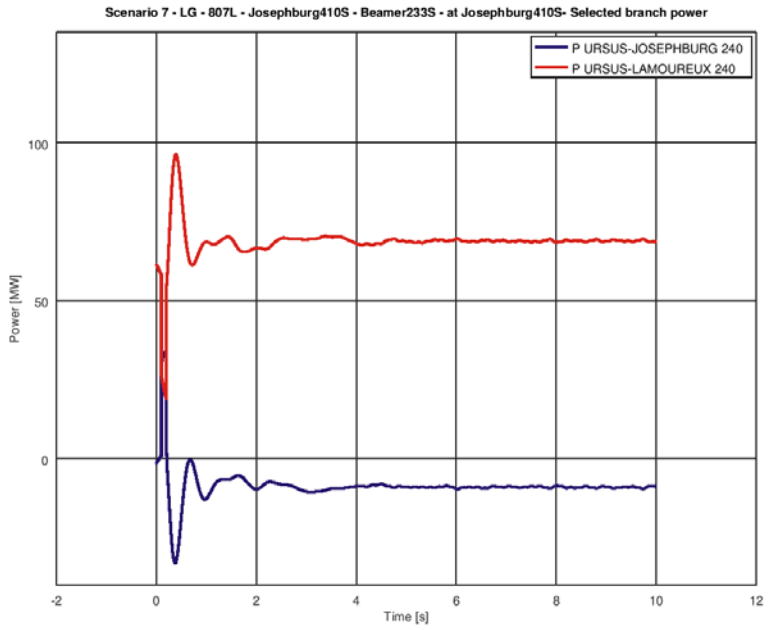


Figure A-687 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

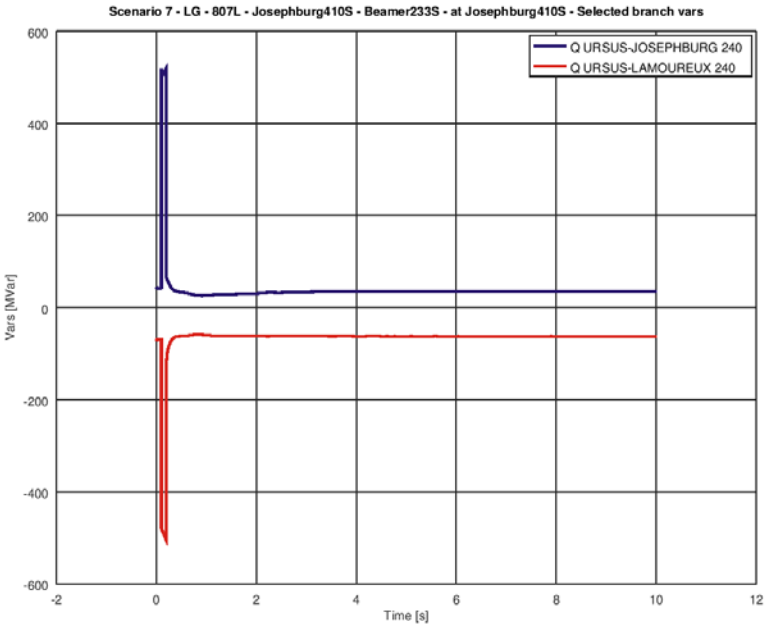


Figure A-688 Scenario 7 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

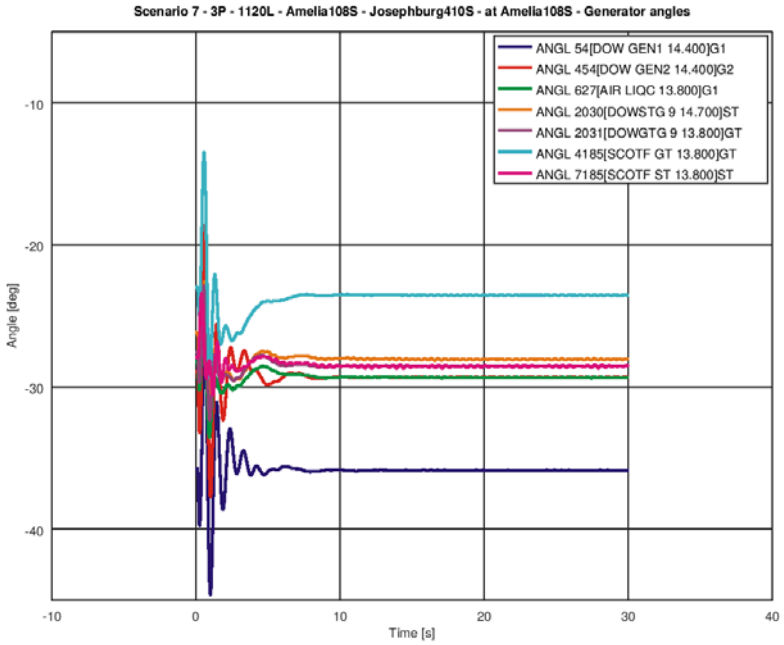


Figure A-689 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

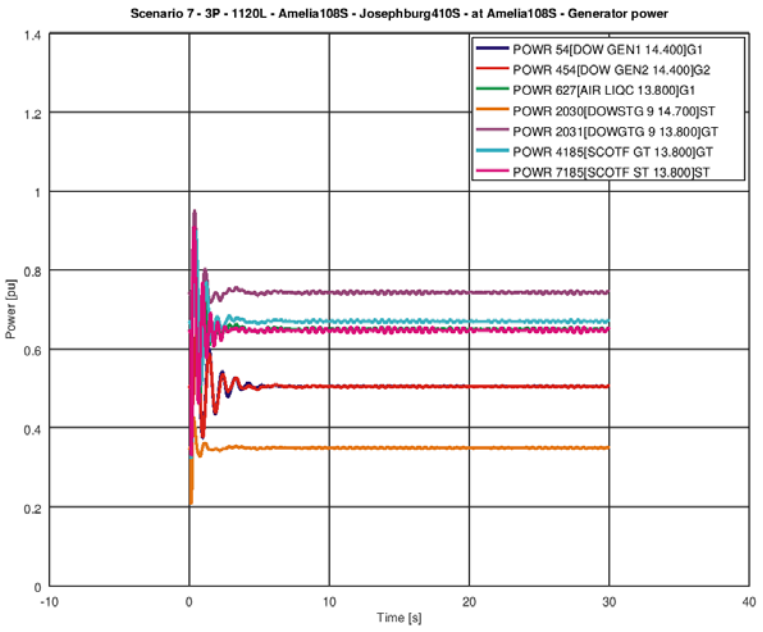


Figure A-690 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

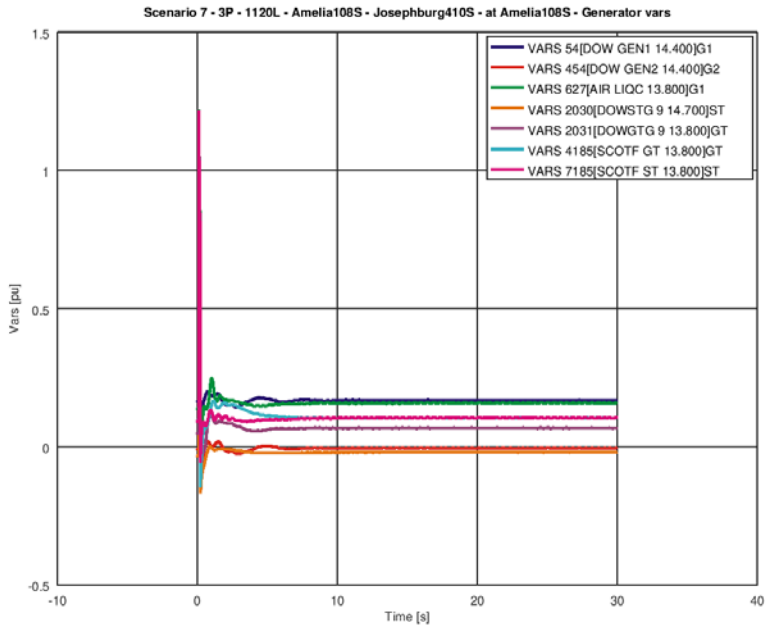


Figure A-691 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

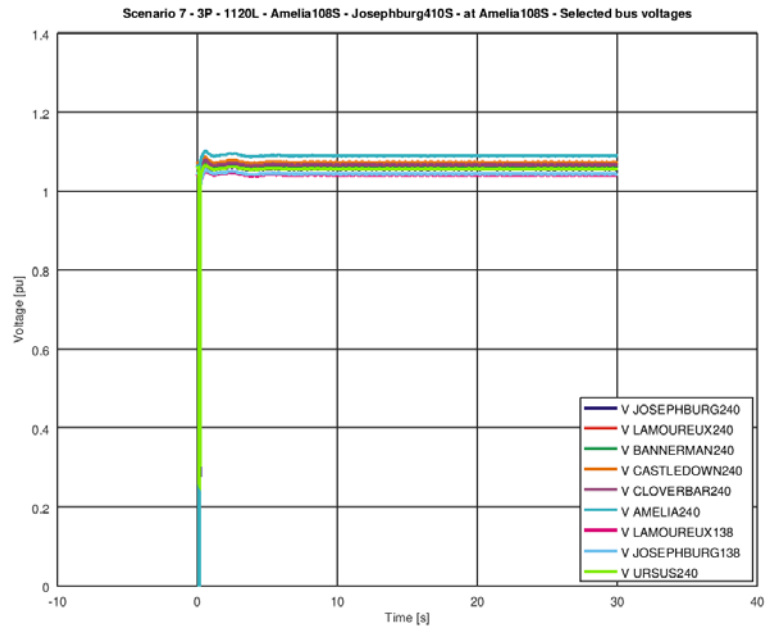


Figure A-692 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

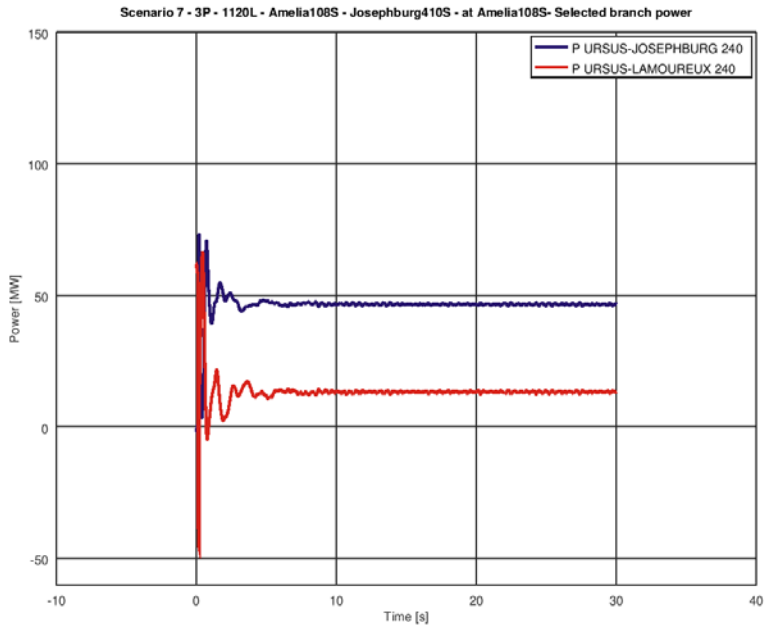


Figure A-693 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

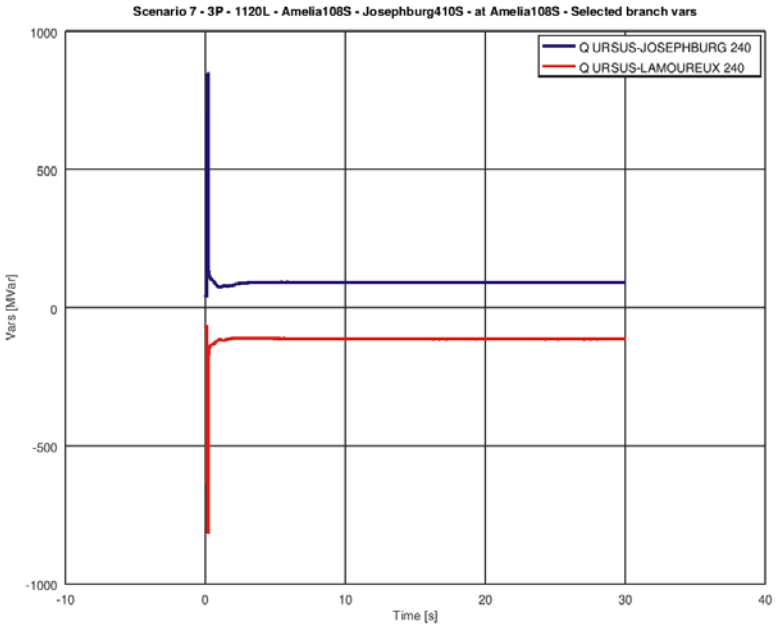


Figure A-694 Scenario 7 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

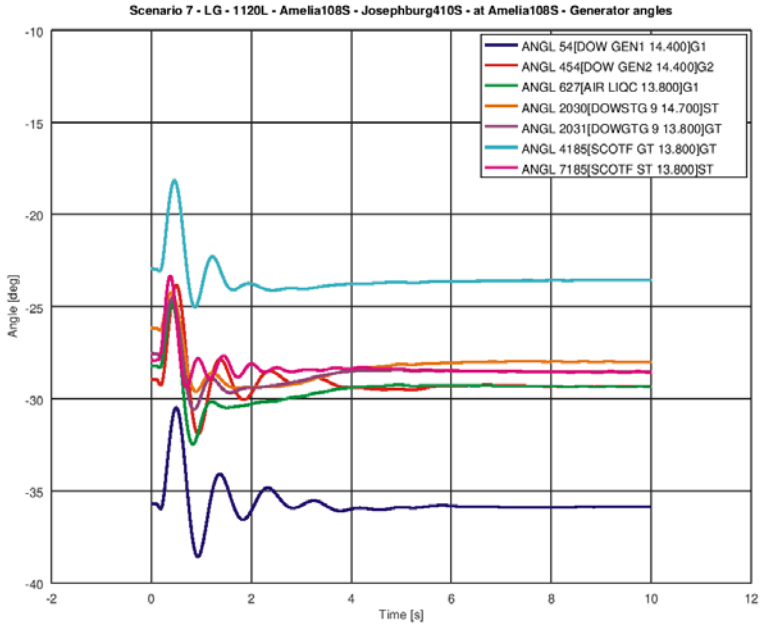


Figure A-695 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

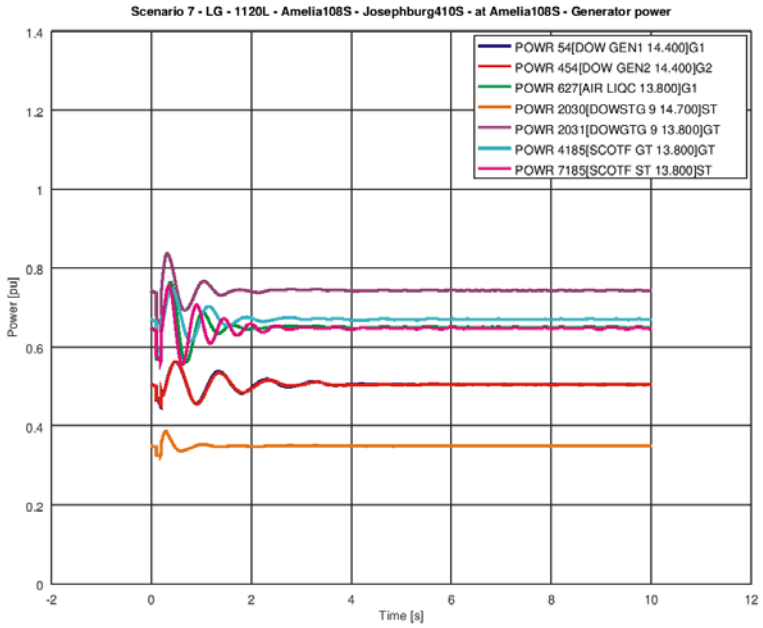


Figure A-696 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

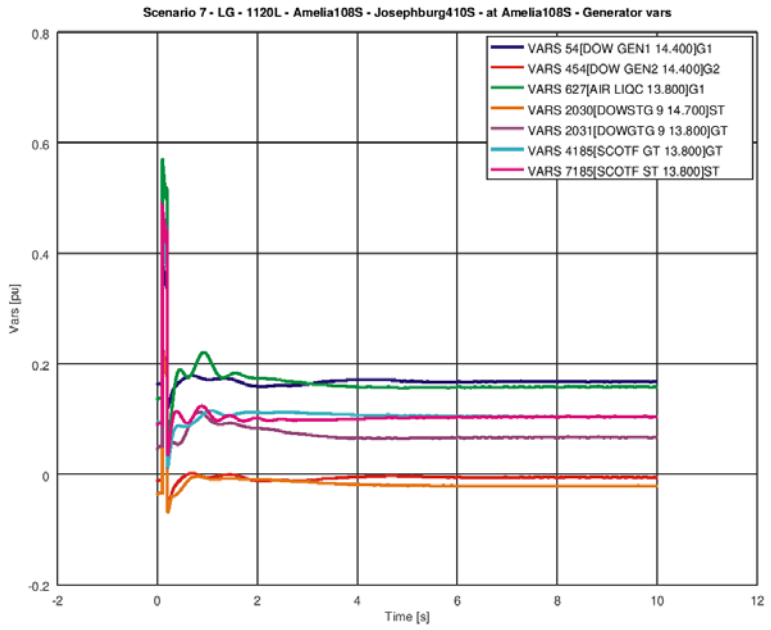


Figure A-697 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

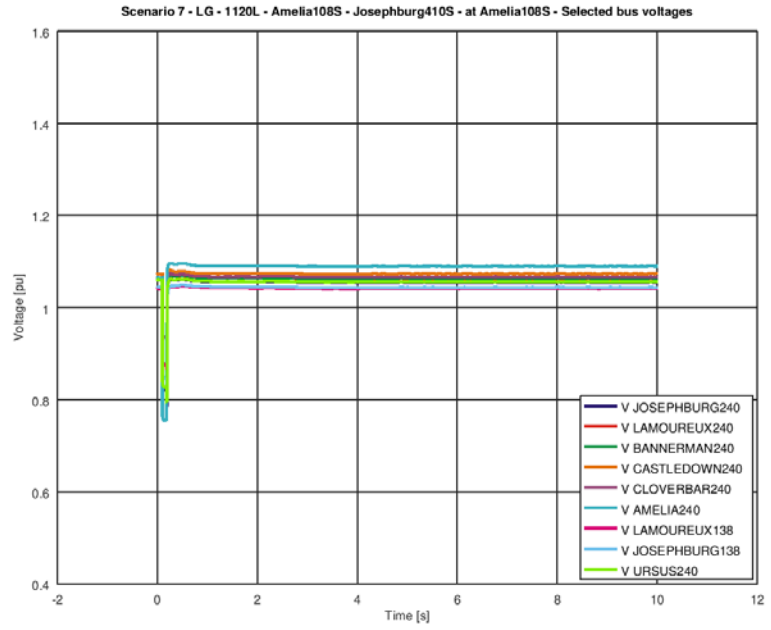


Figure A-698 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

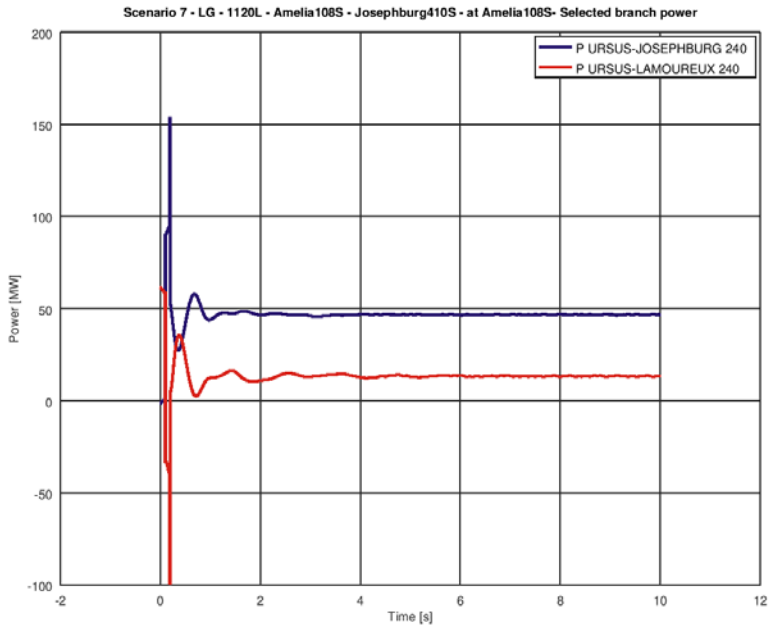


Figure A-699 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

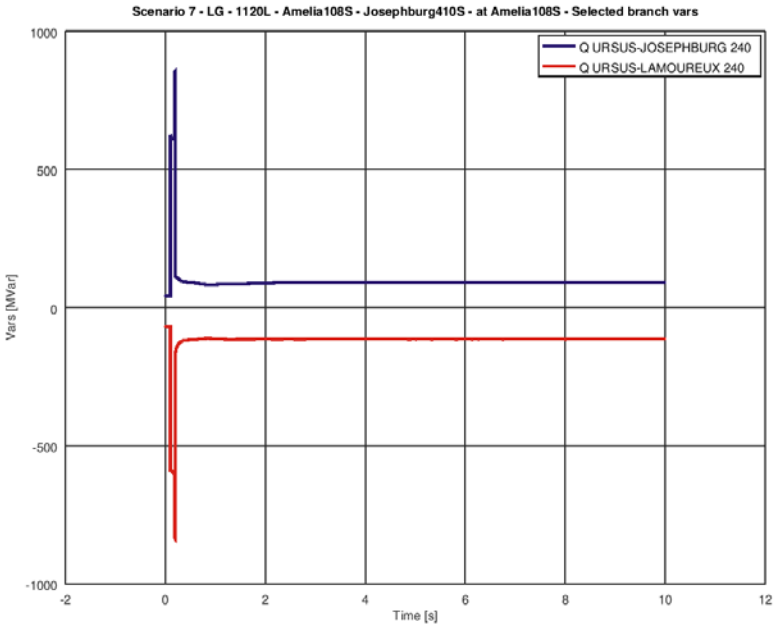


Figure A-700 Scenario 7 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

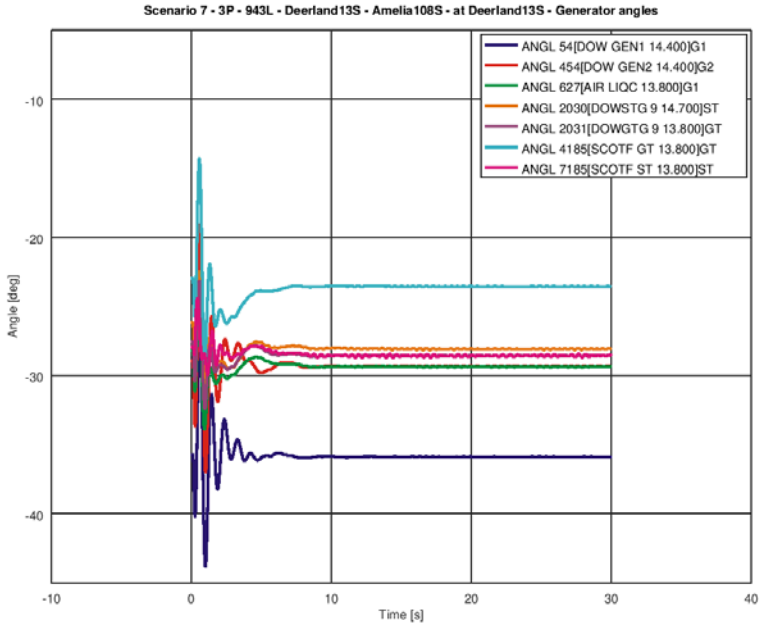


Figure A-701 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

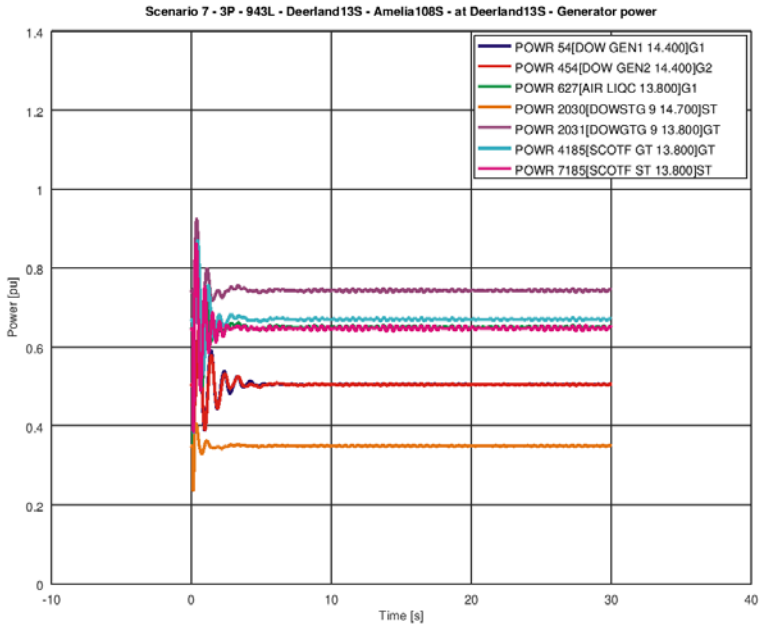


Figure A-702 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

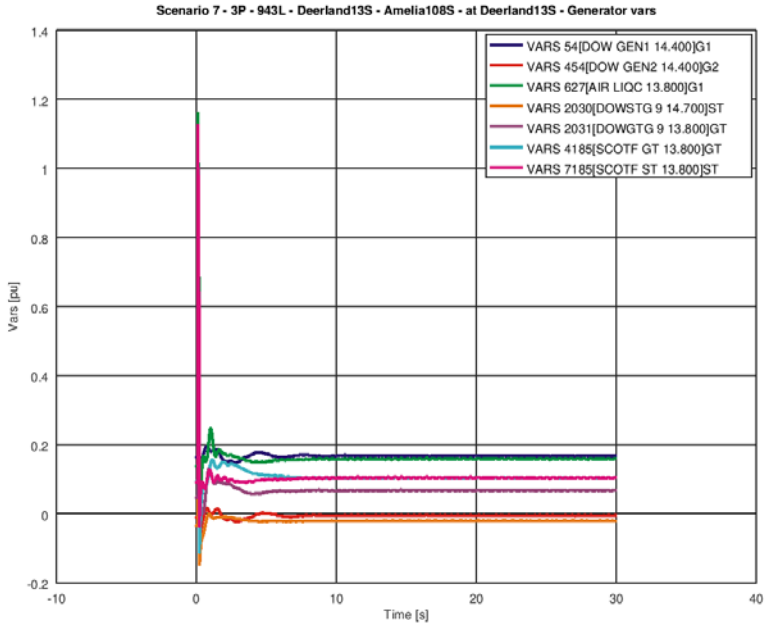


Figure A-703 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

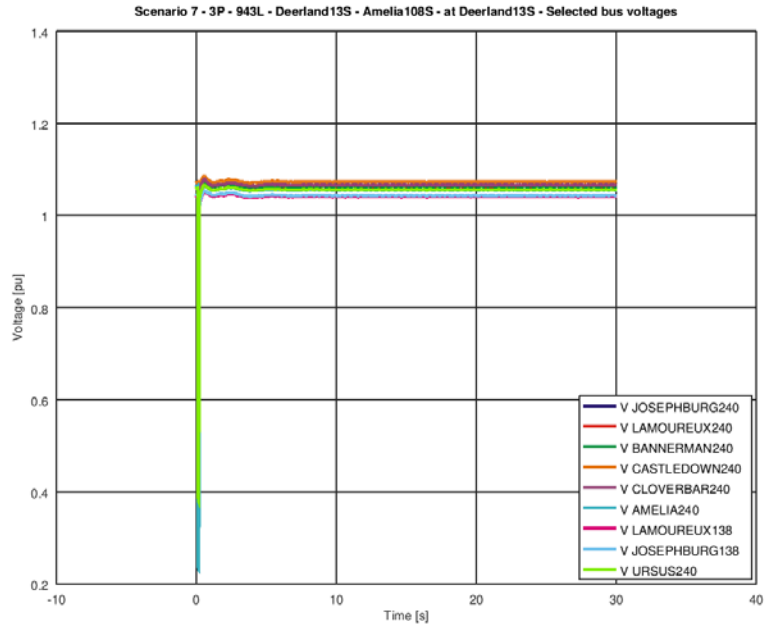


Figure A-704 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

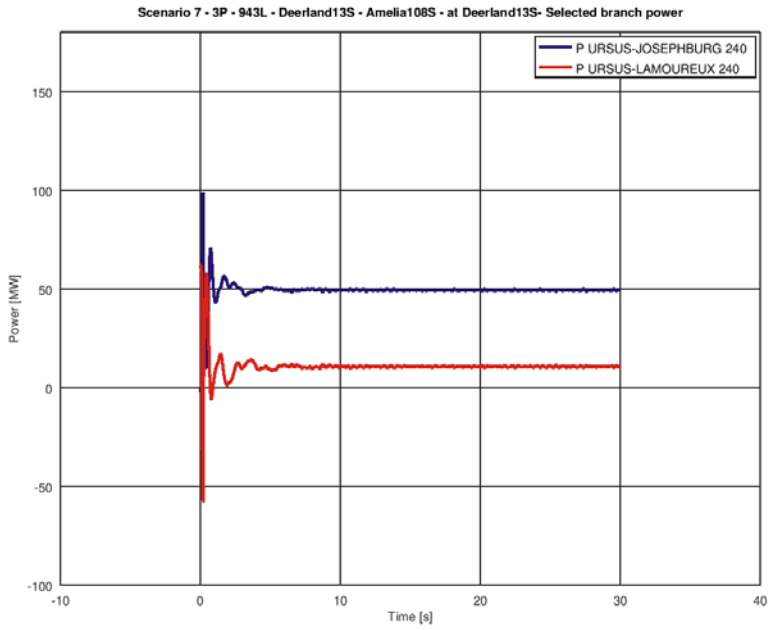


Figure A-705 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

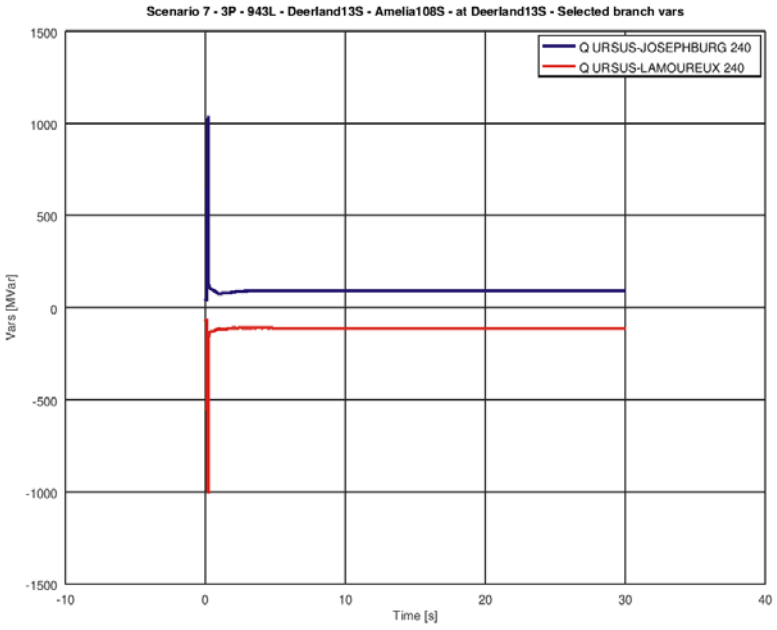


Figure A-706 Scenario 7 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

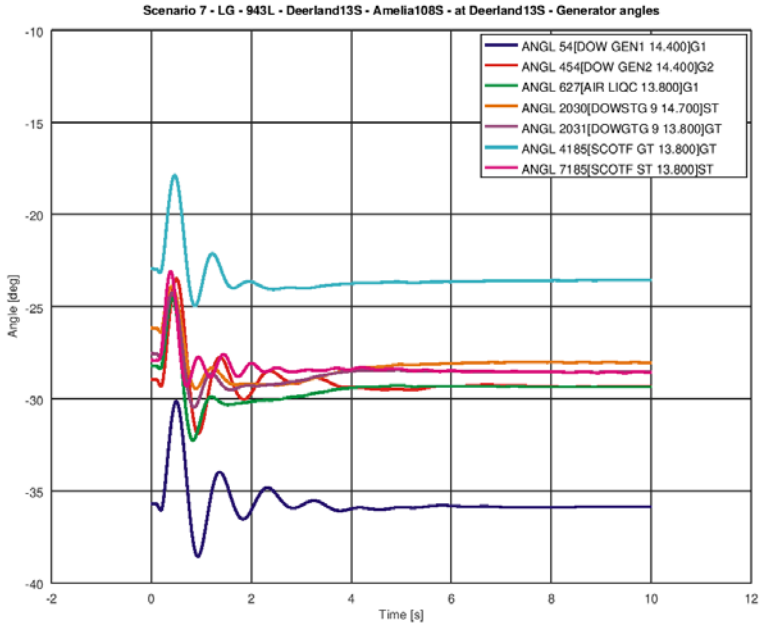


Figure A-707 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

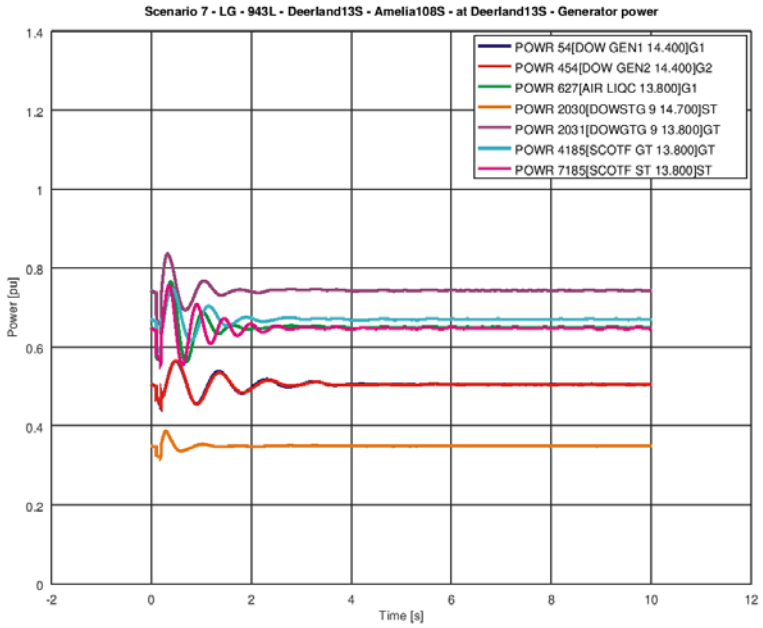


Figure A-708 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

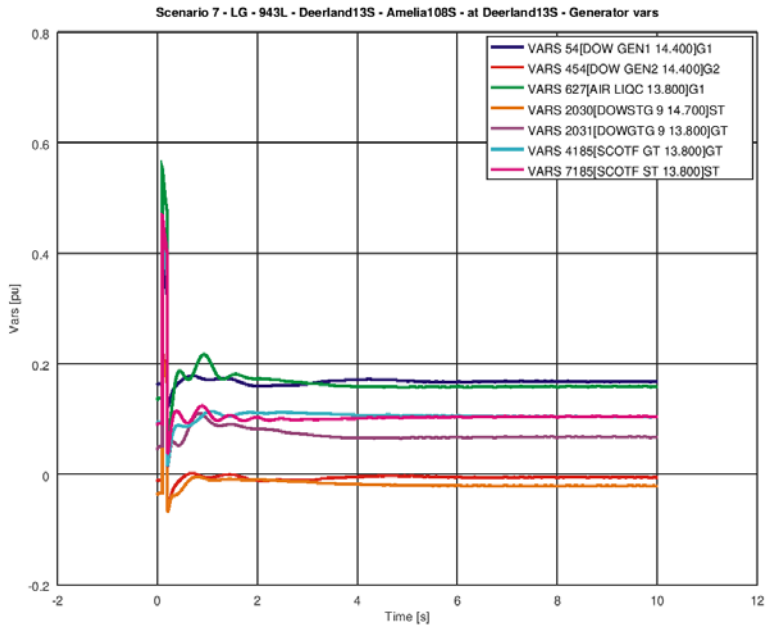


Figure A-709 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

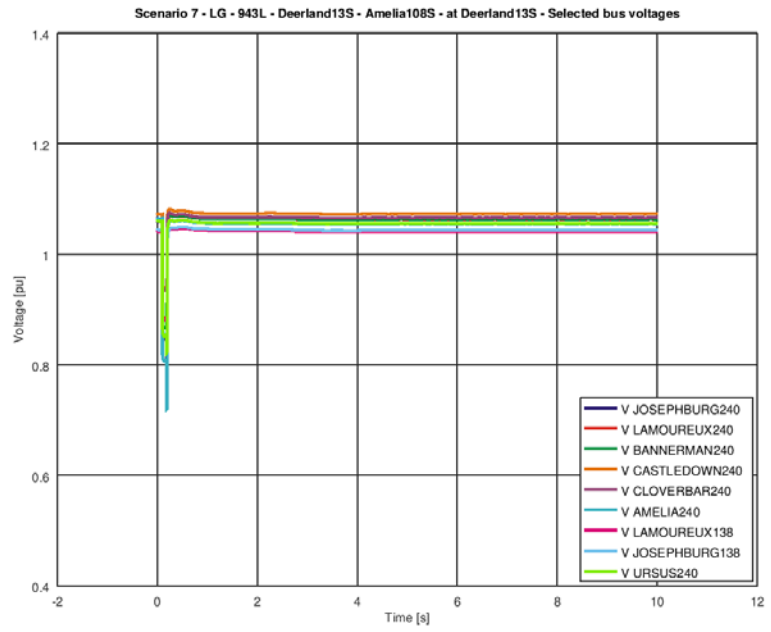


Figure A-710 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

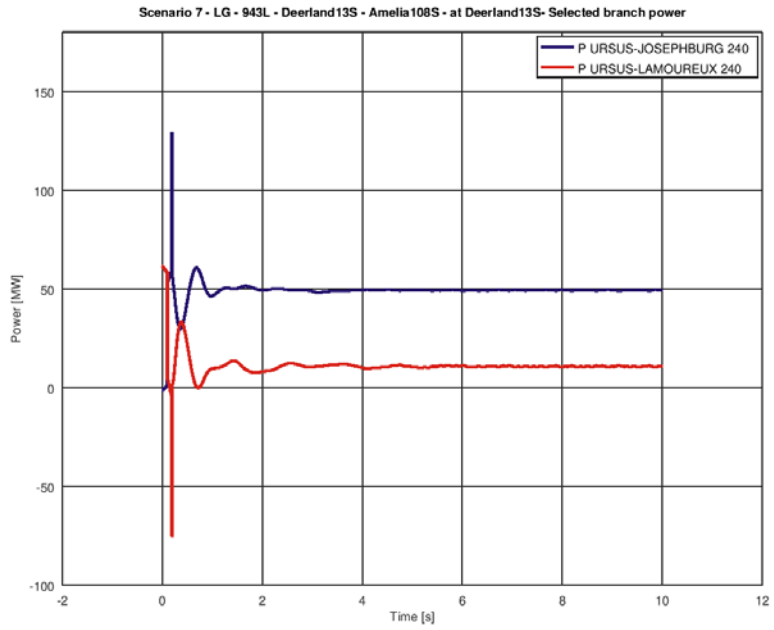


Figure A-711 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

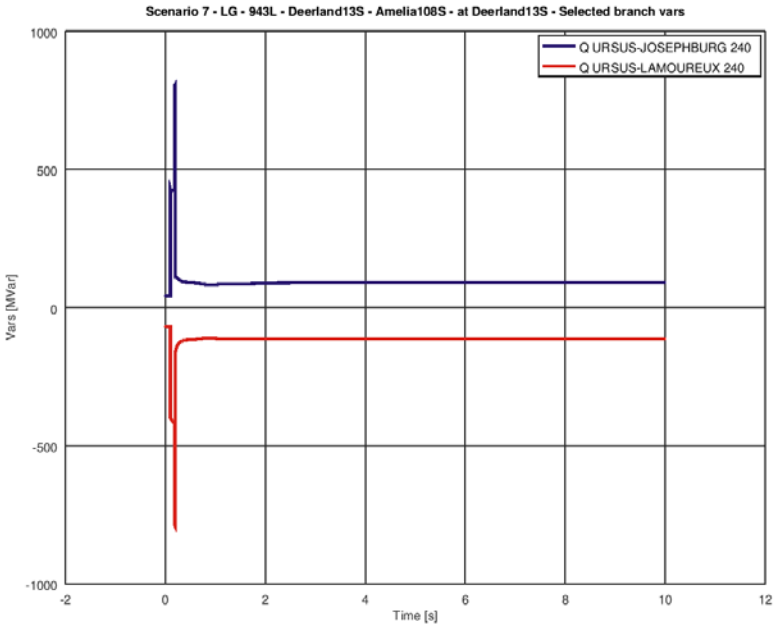


Figure A-712 Scenario 7 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

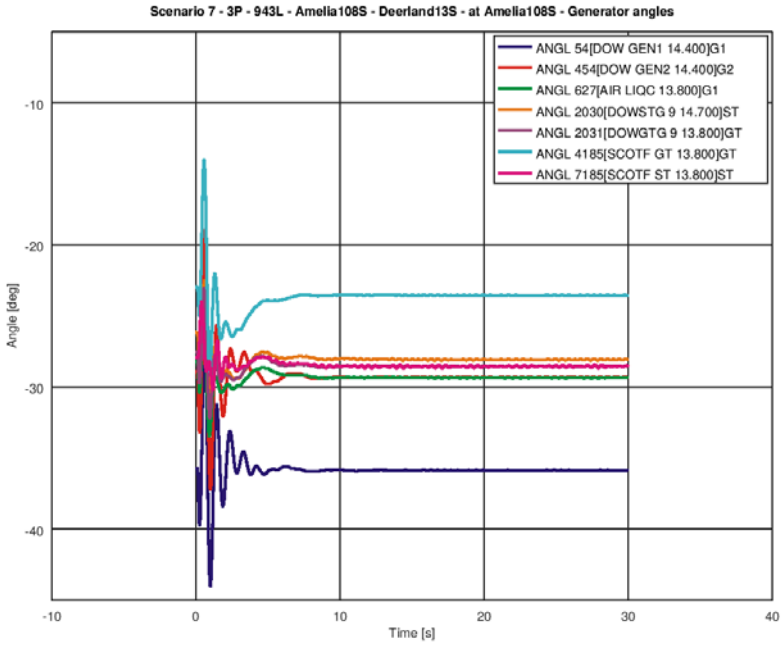


Figure A-713 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

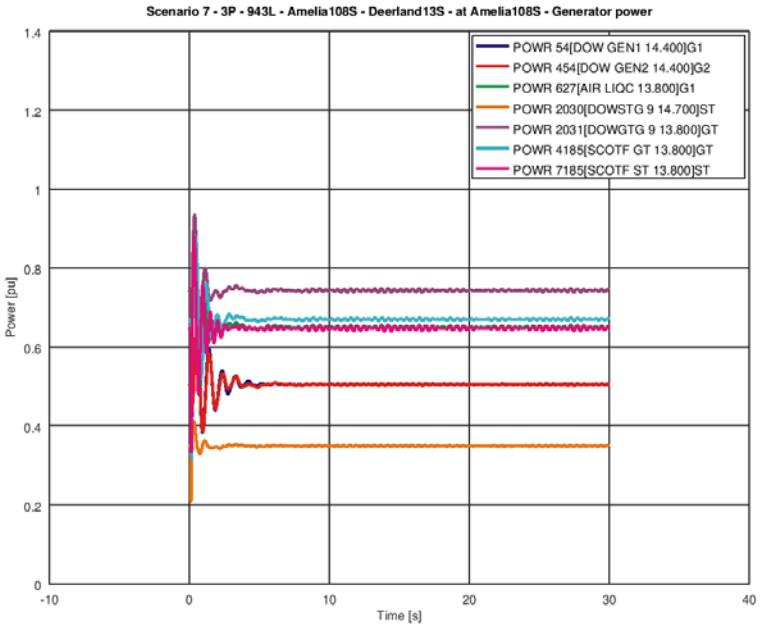


Figure A-714 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

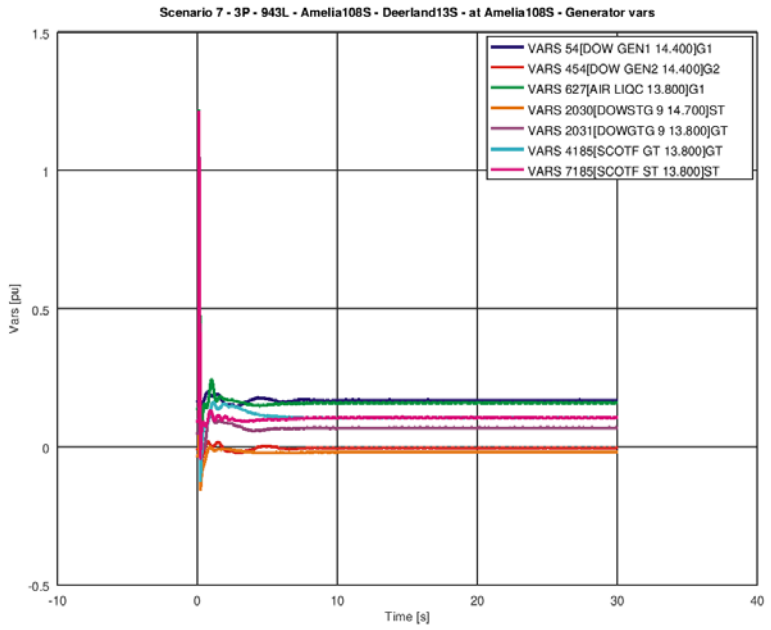


Figure A-715 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

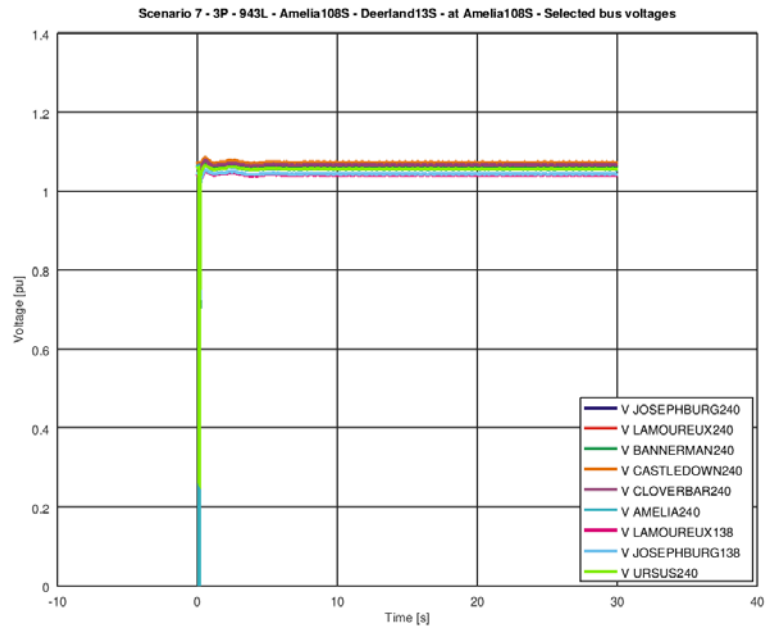


Figure A-716 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

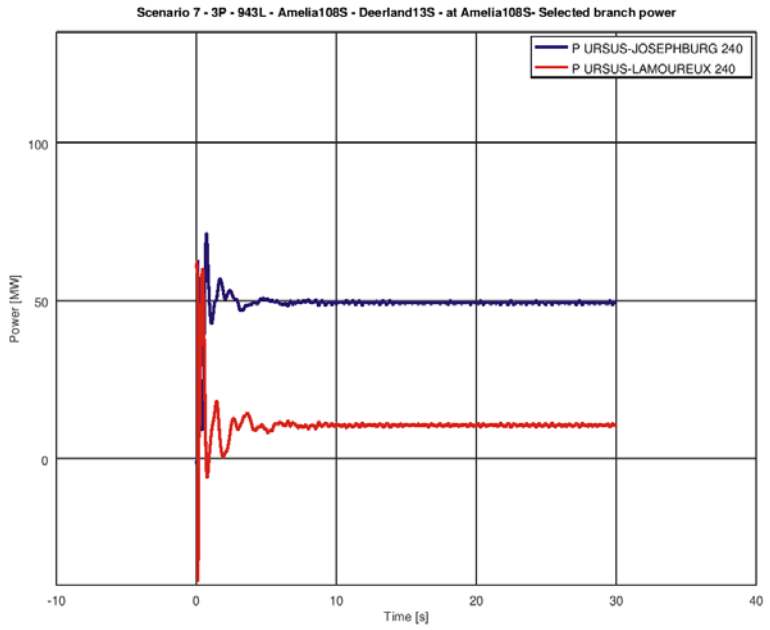


Figure A-717 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

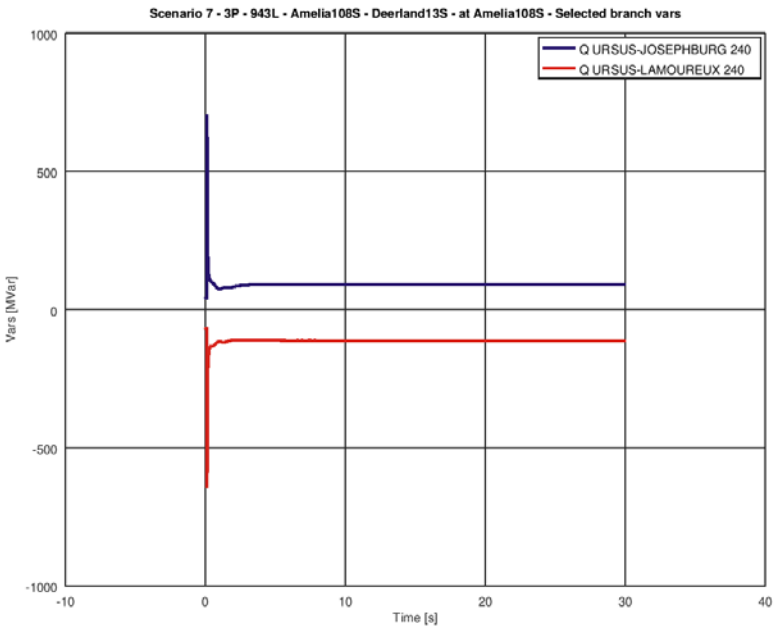


Figure A-718 Scenario 7 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

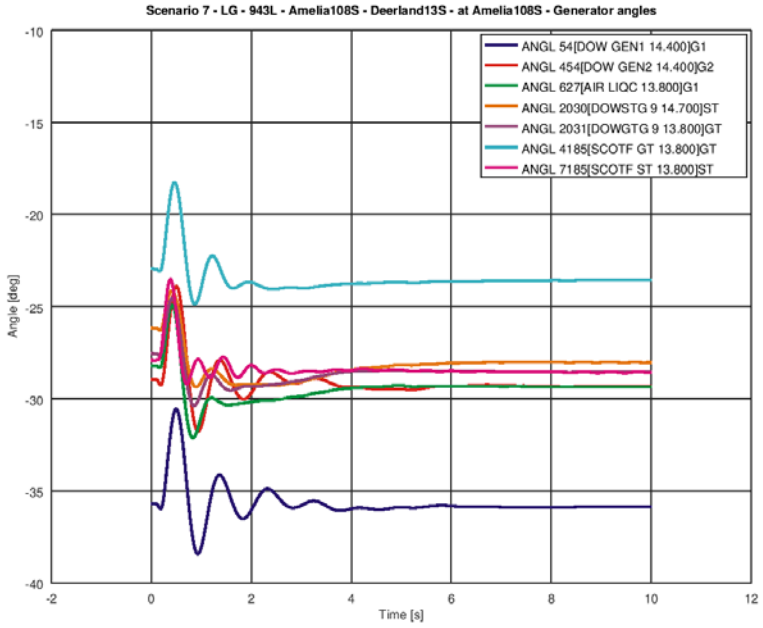


Figure A-719 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

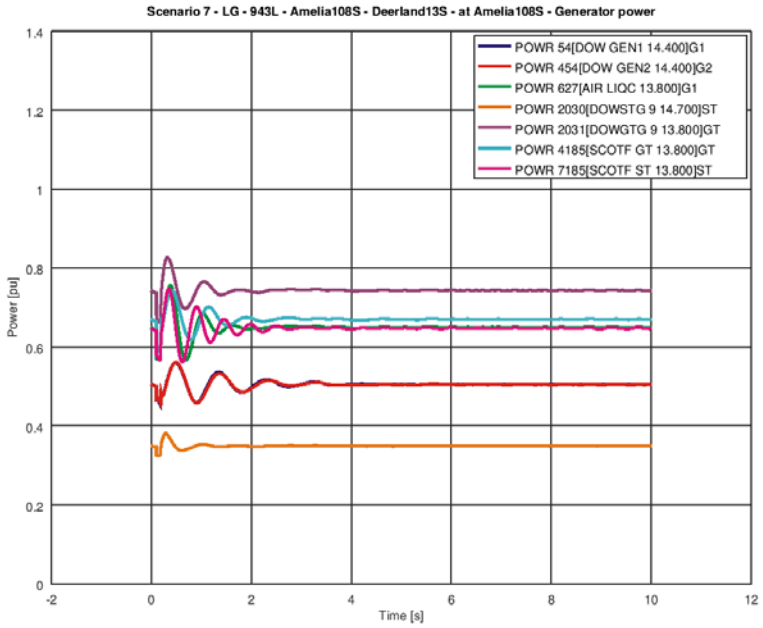


Figure A-720 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

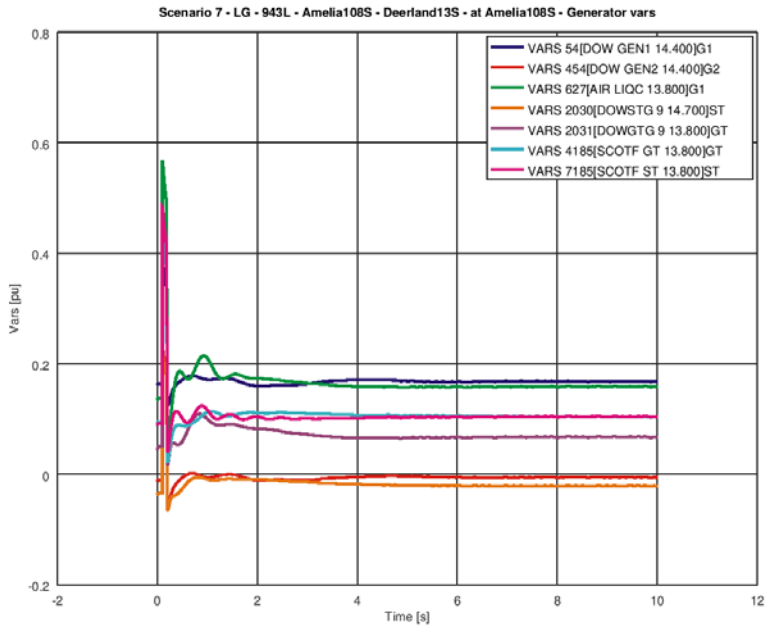


Figure A-721 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

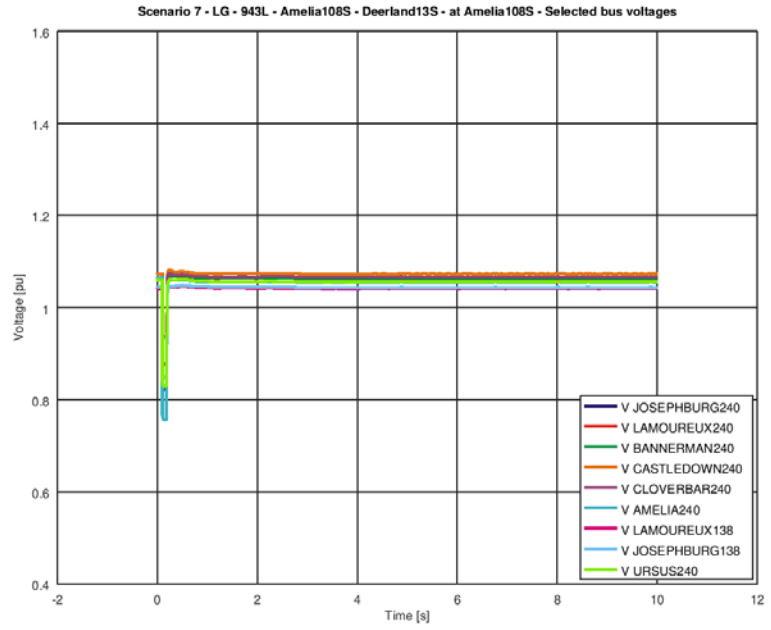


Figure A-722 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

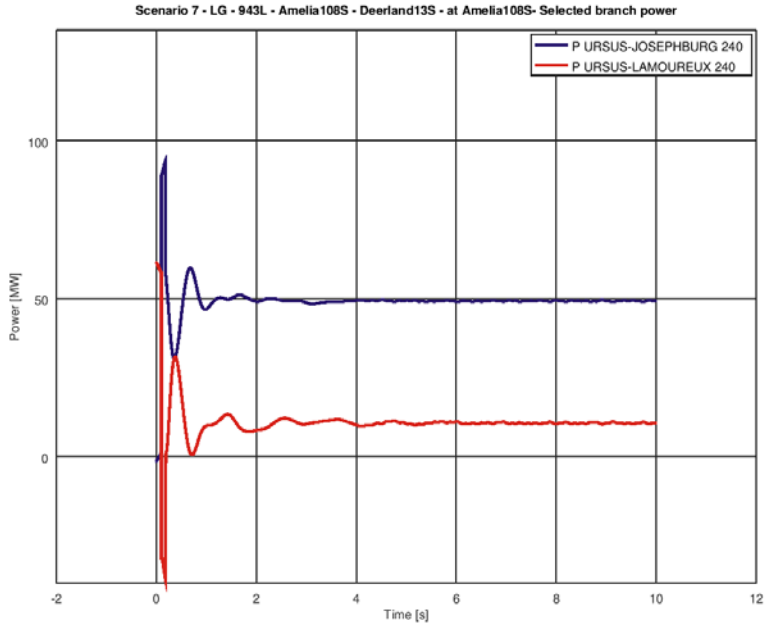


Figure A-723 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

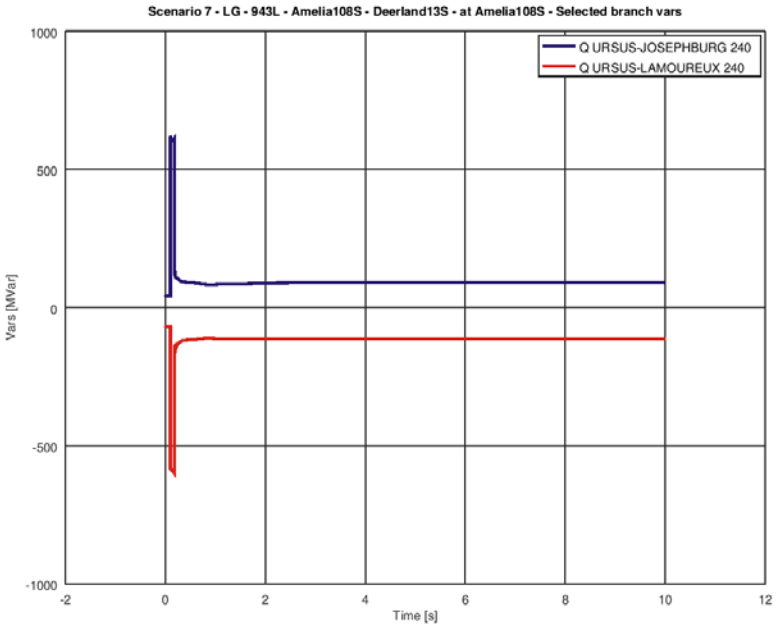


Figure A-724 Scenario 7 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

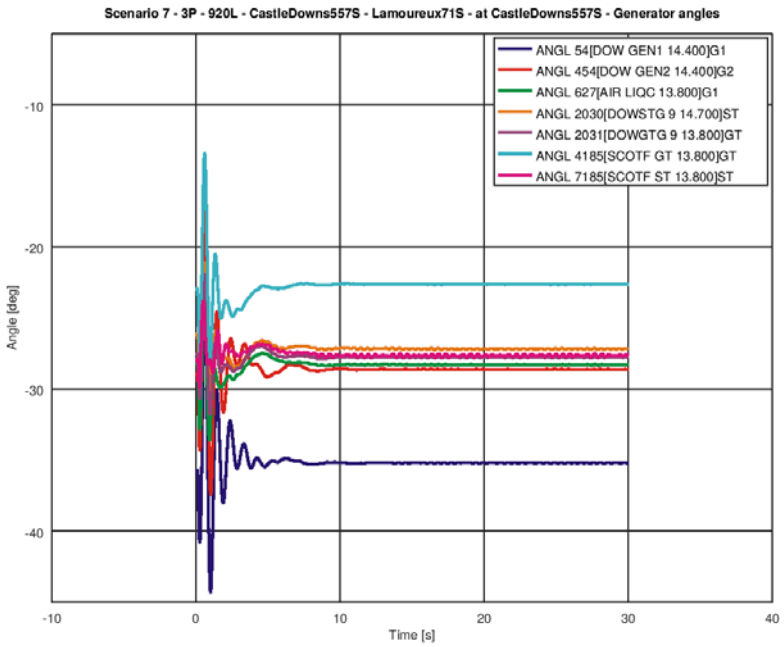


Figure A-725 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

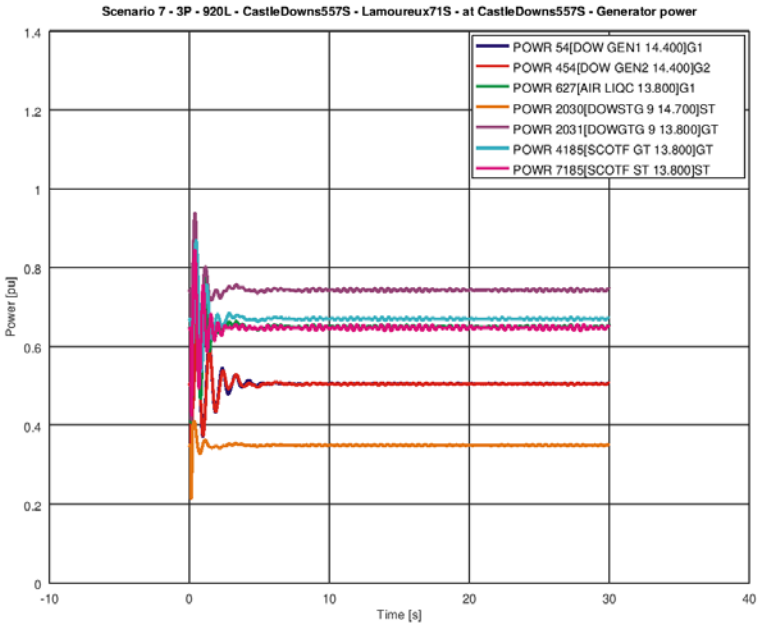


Figure A-726 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

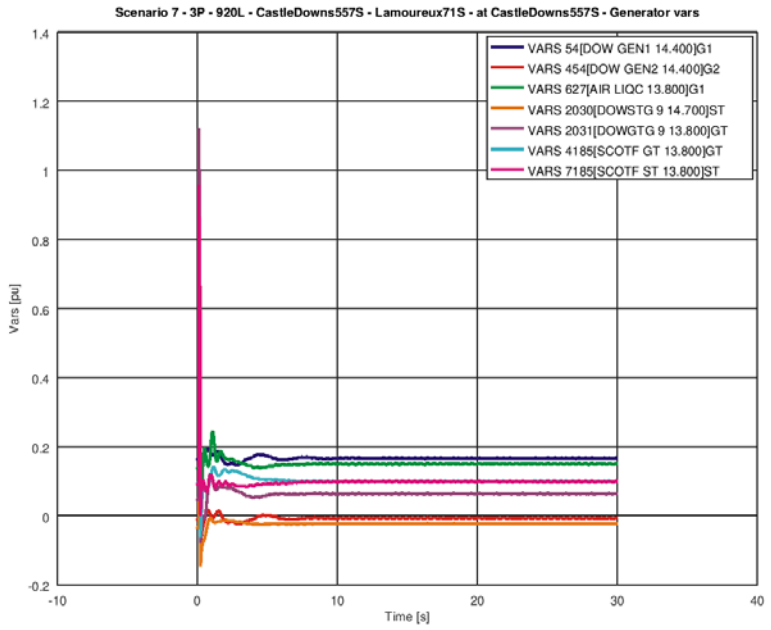


Figure A-727 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

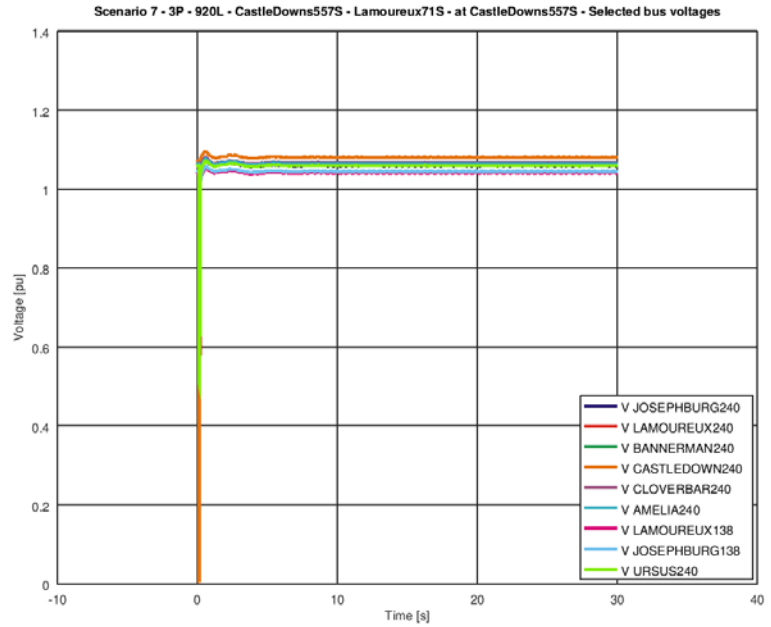


Figure A-728 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

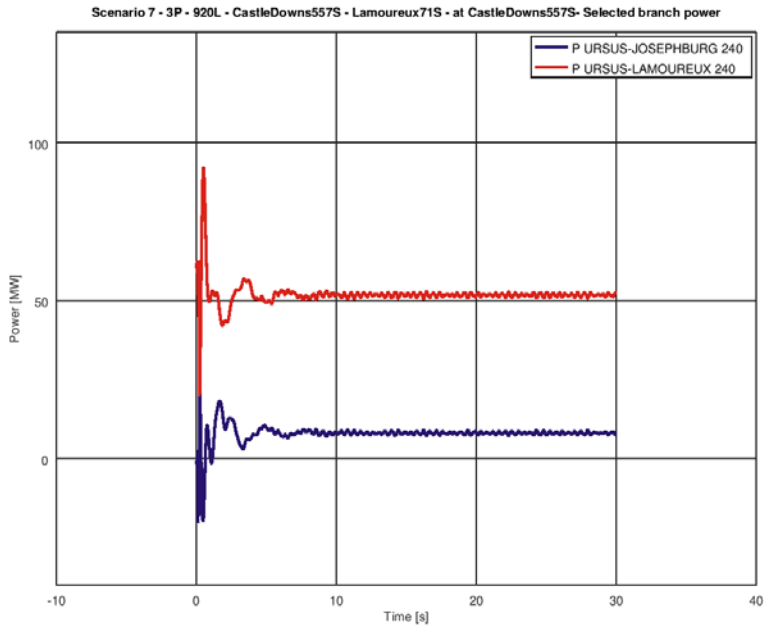


Figure A-729 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

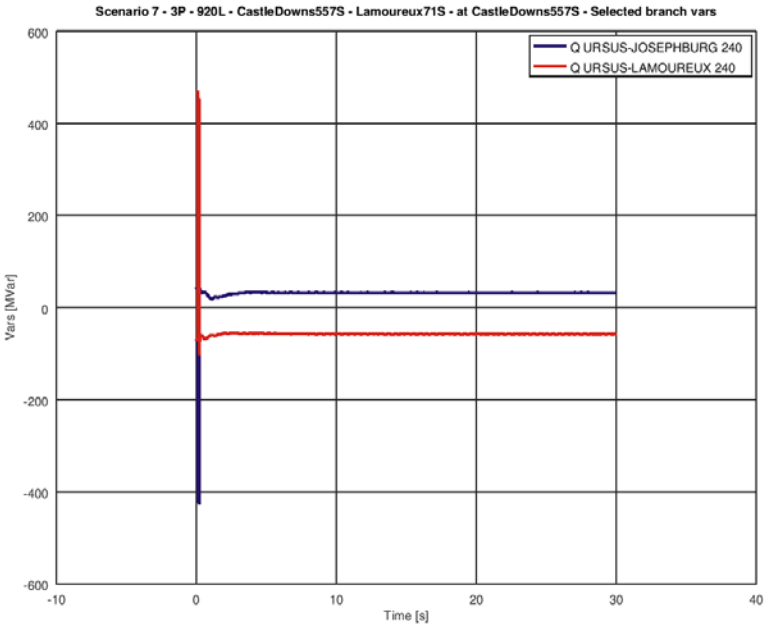


Figure A-730 Scenario 7 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

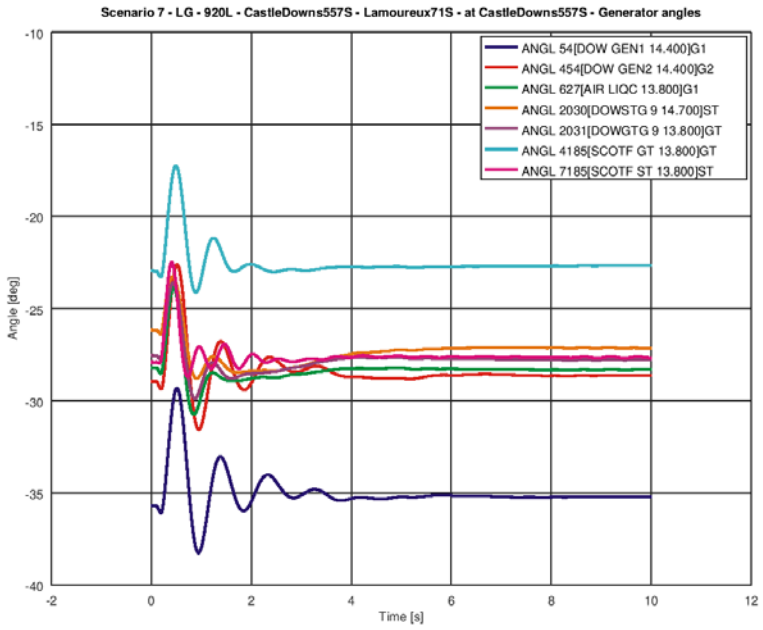


Figure A-731 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

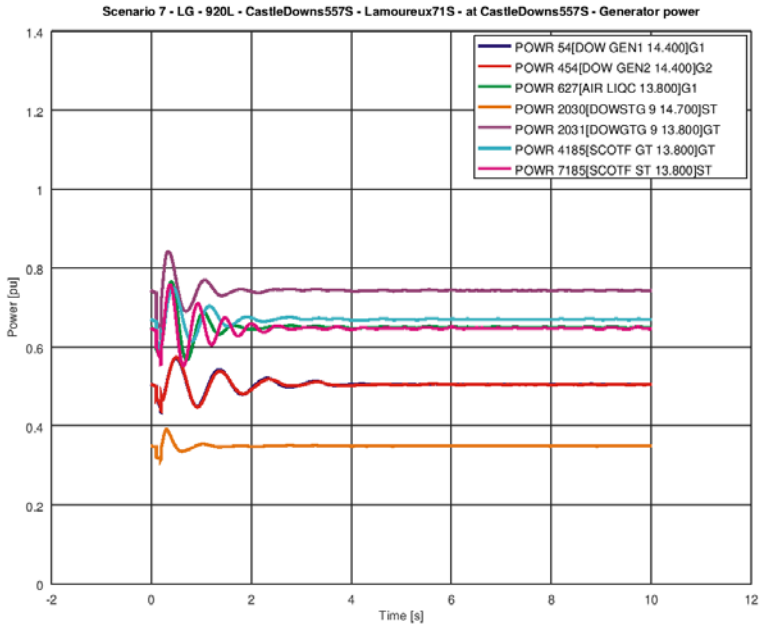


Figure A-732 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

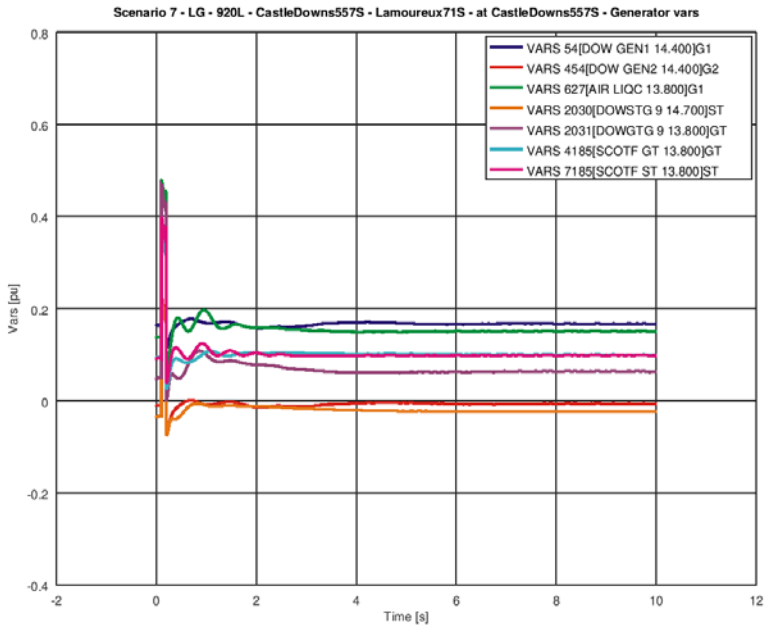


Figure A-733 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

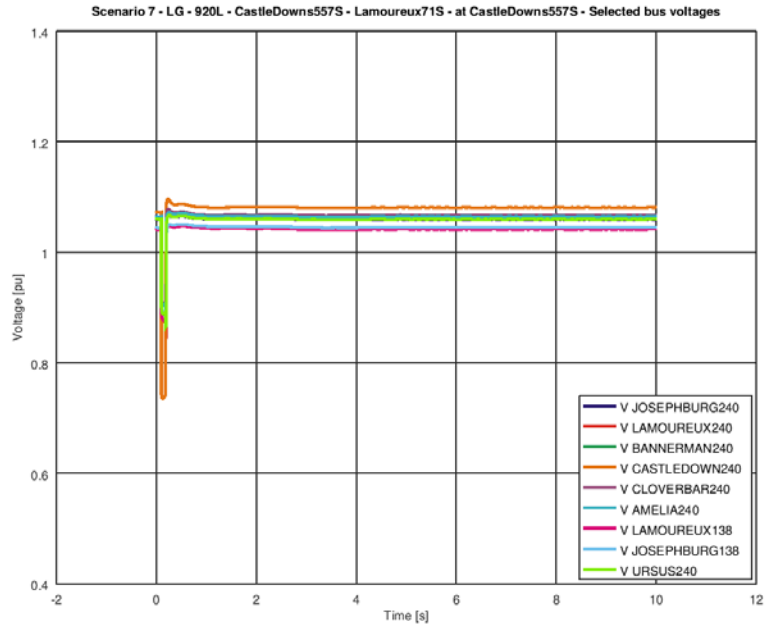


Figure A-734 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

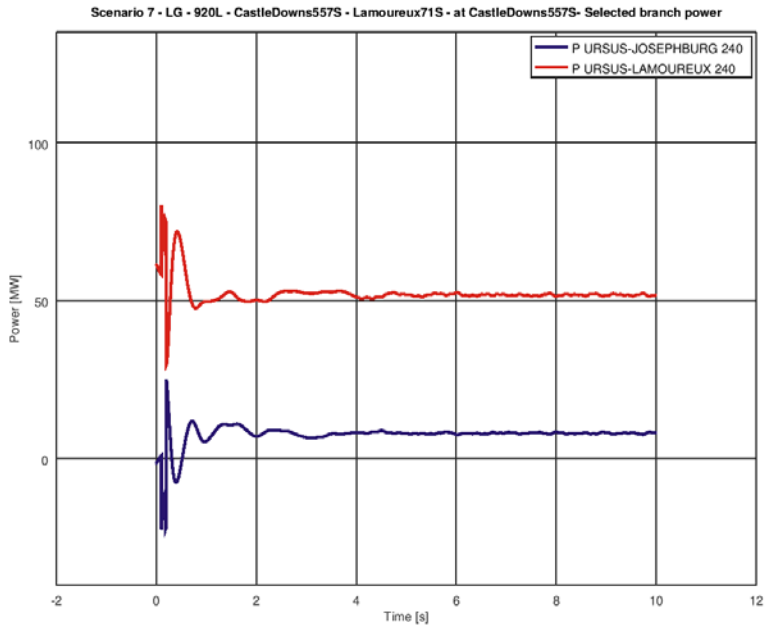


Figure A-735 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

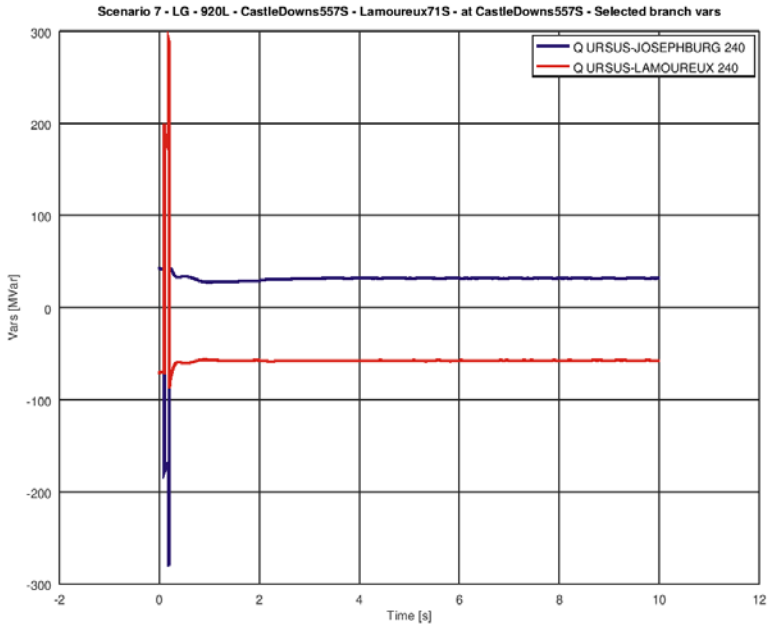


Figure A-736 Scenario 7 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

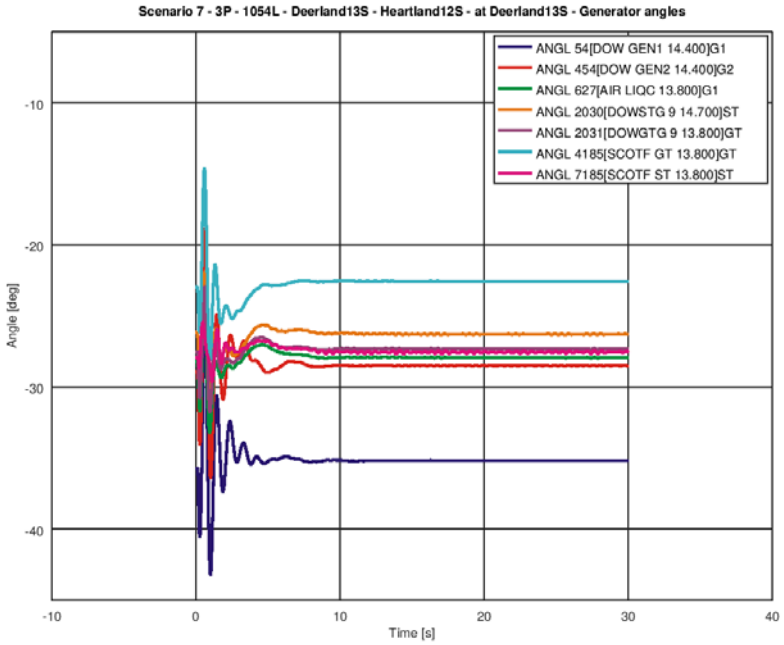


Figure A-737 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

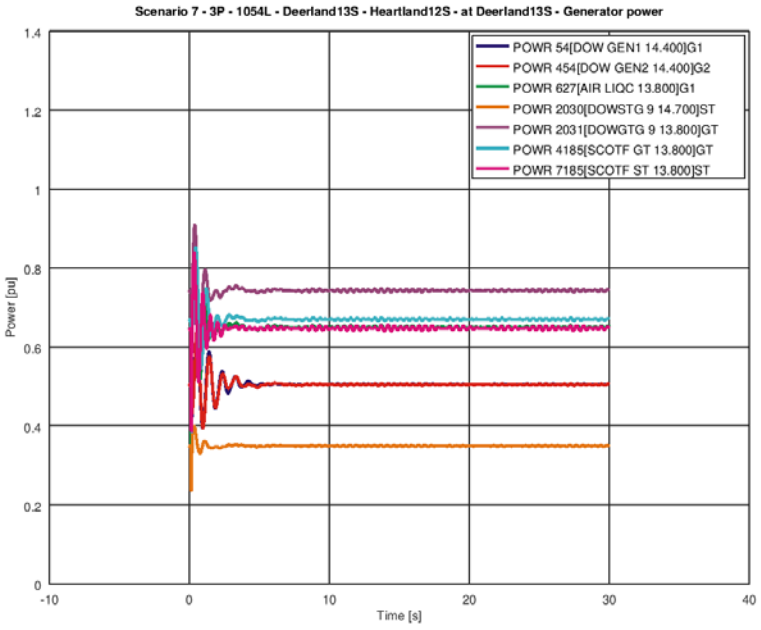


Figure A-738 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

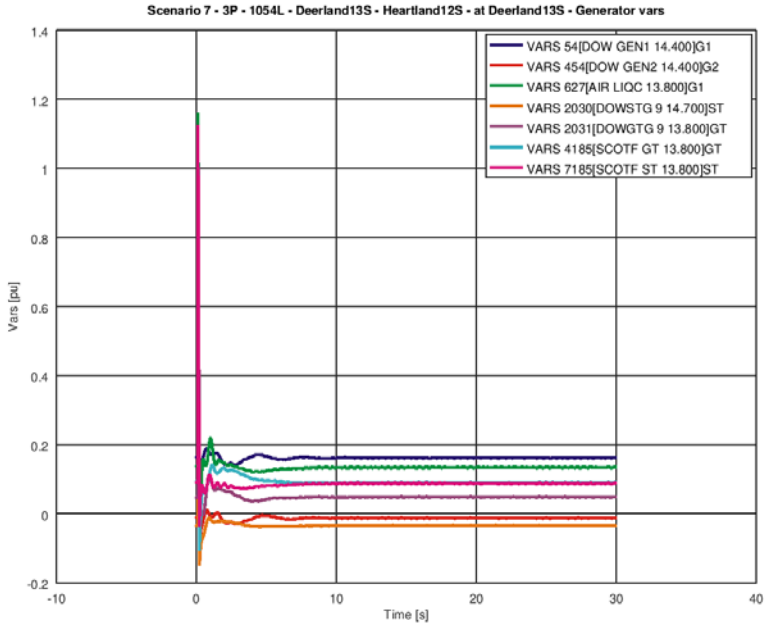


Figure A-739 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

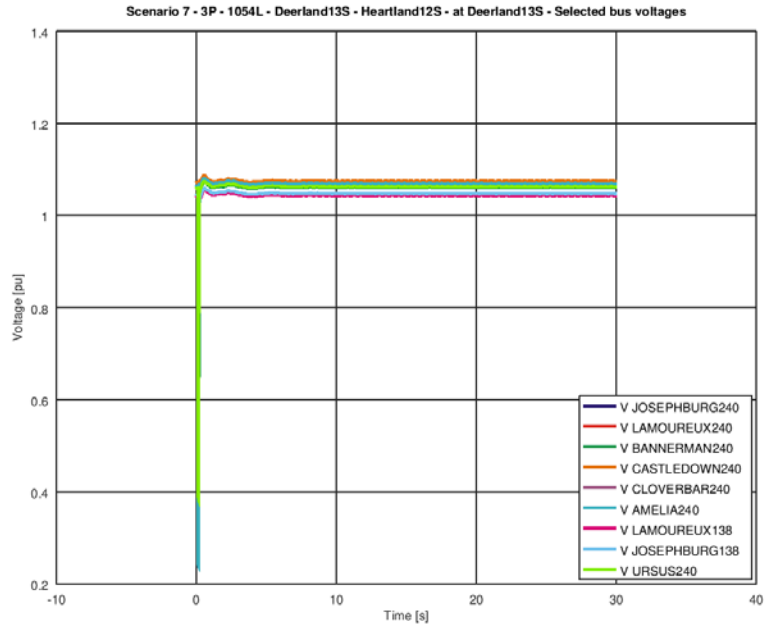


Figure A-740 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

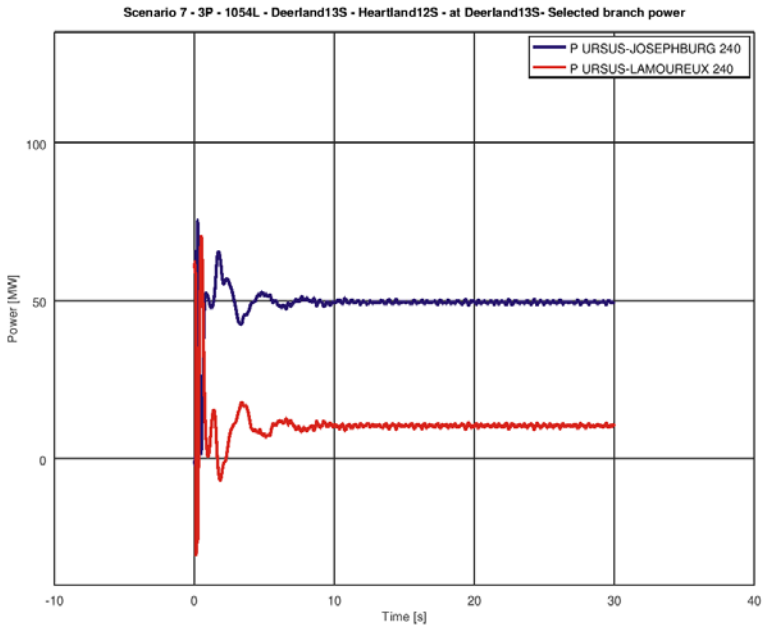


Figure A-741 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

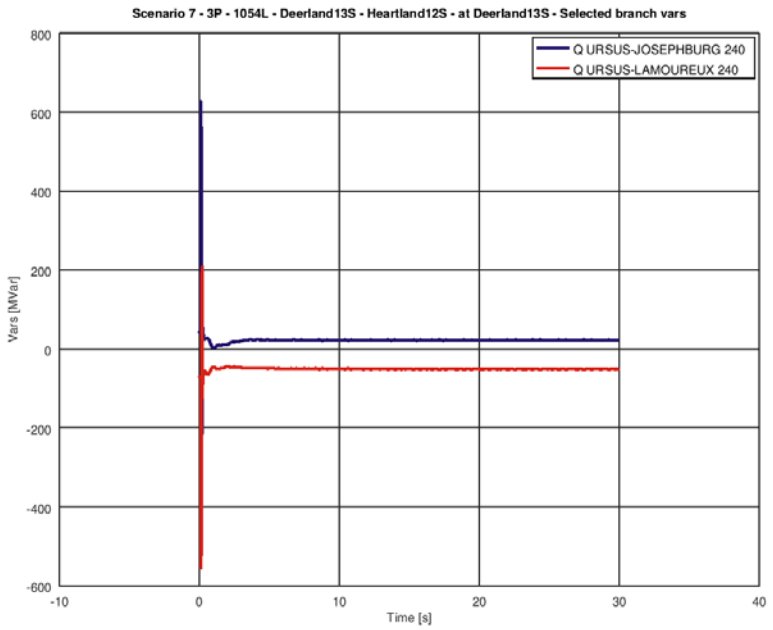


Figure A-742 Scenario 7 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

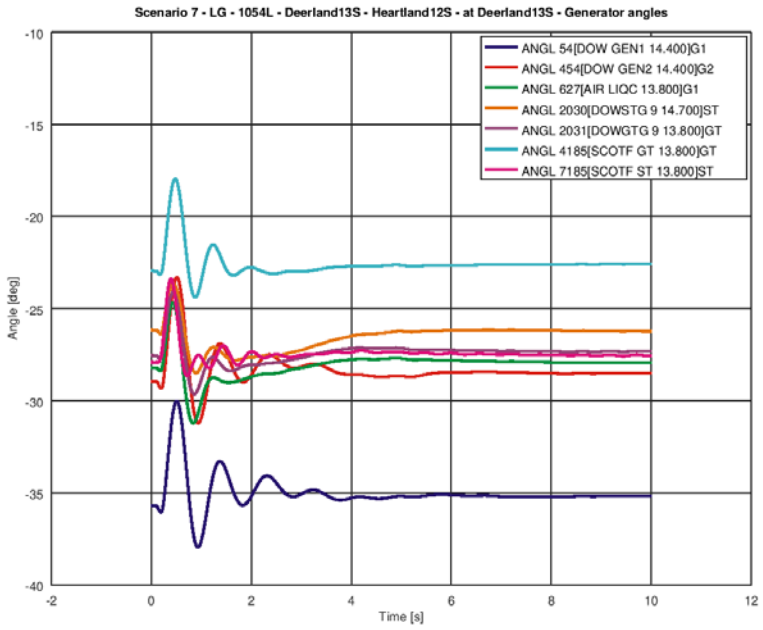


Figure A-743 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

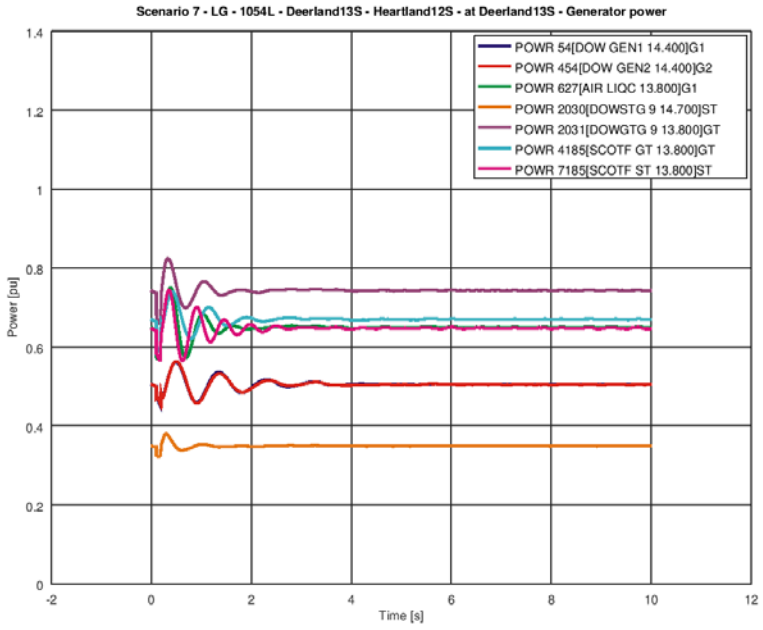


Figure A-744 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

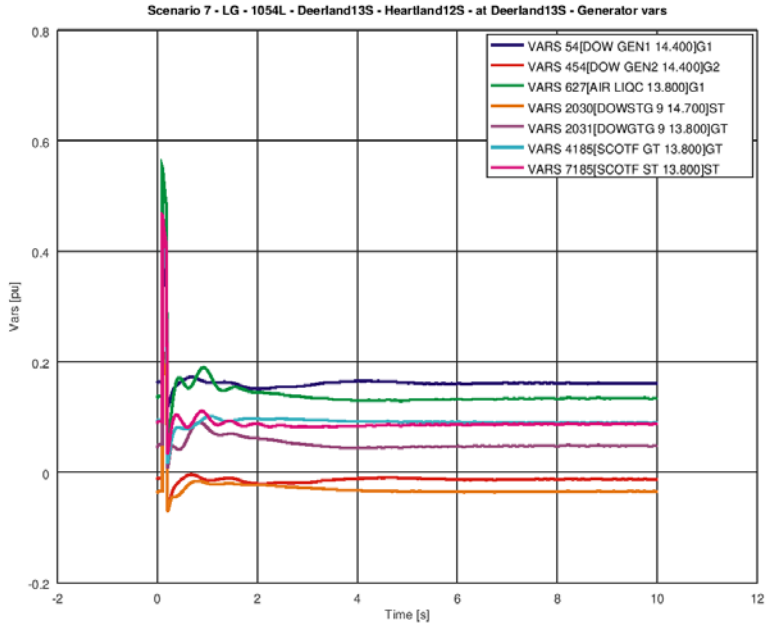


Figure A-745 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

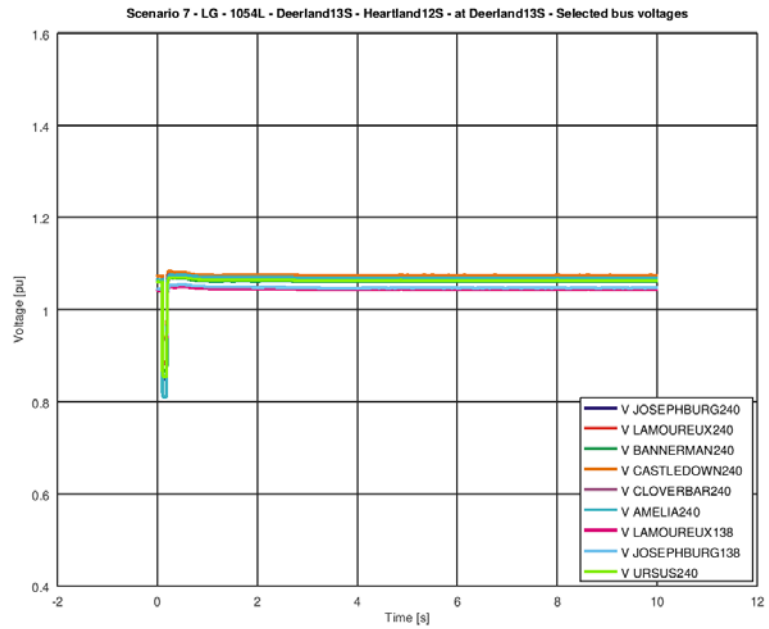


Figure A-746 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

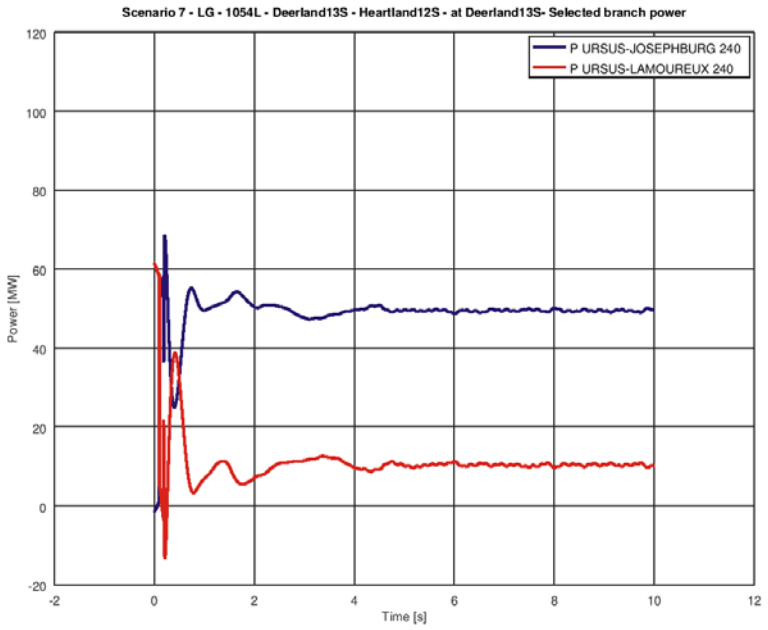


Figure A-747 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

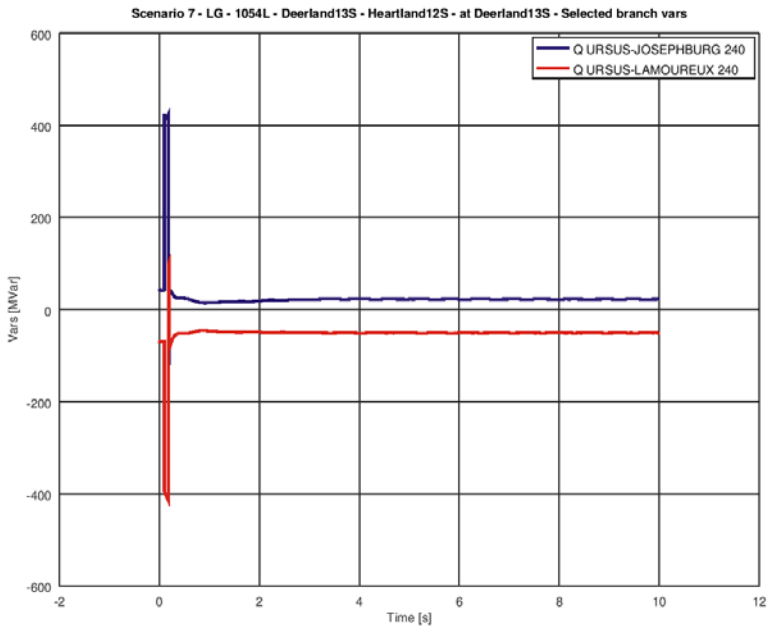


Figure A-748 Scenario 7 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

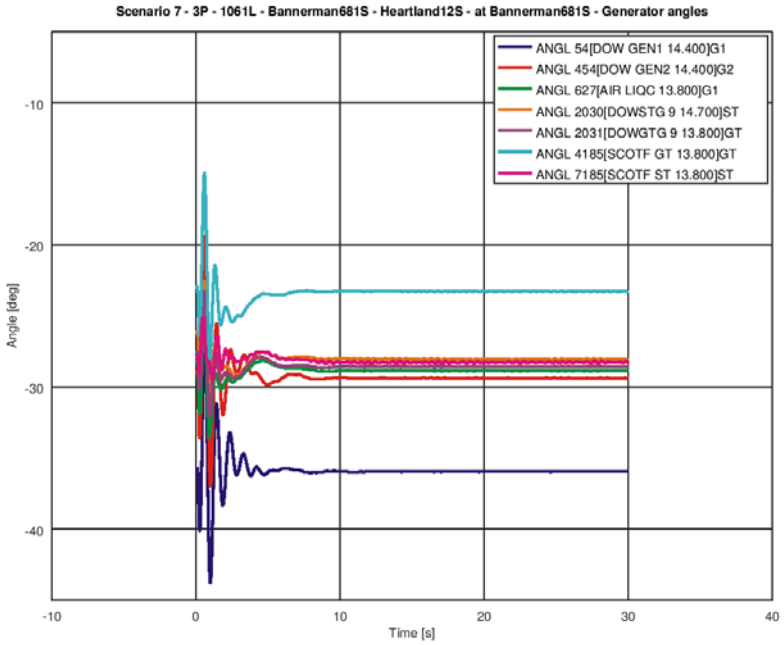


Figure A-749 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

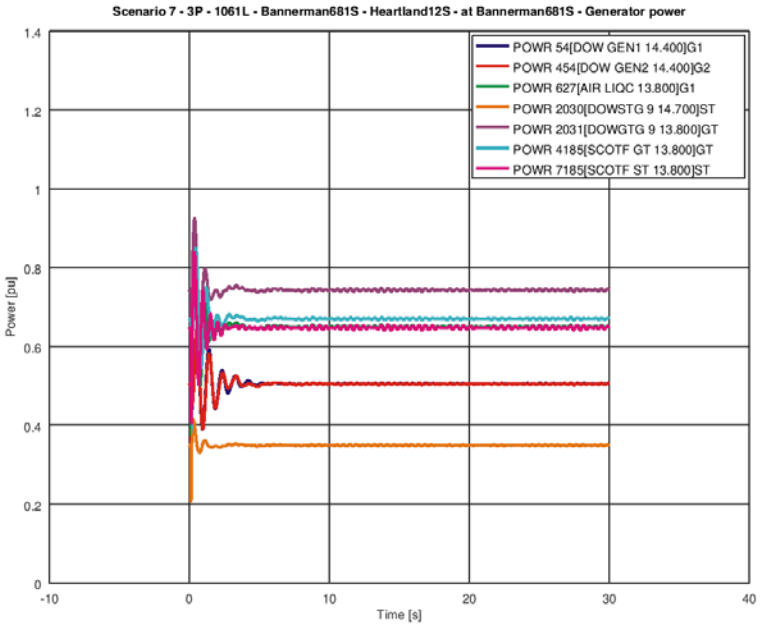


Figure A-750 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

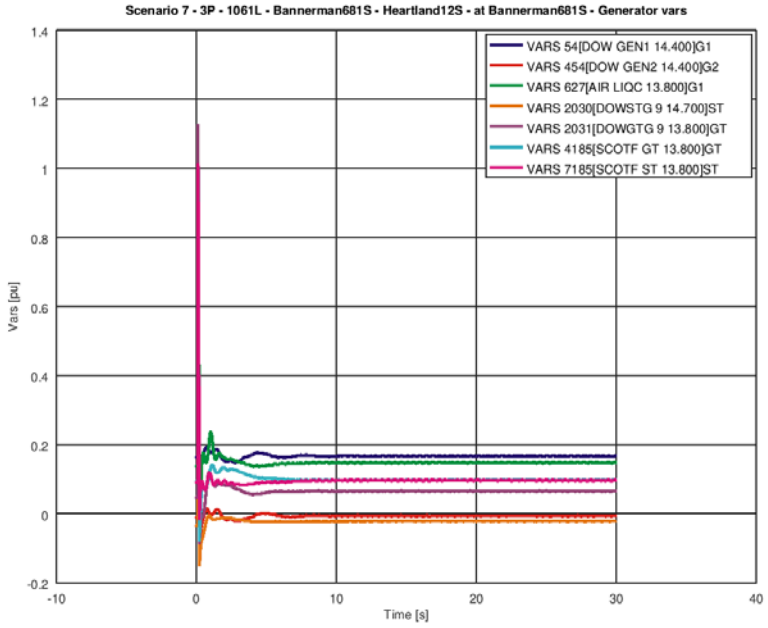


Figure A-751 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

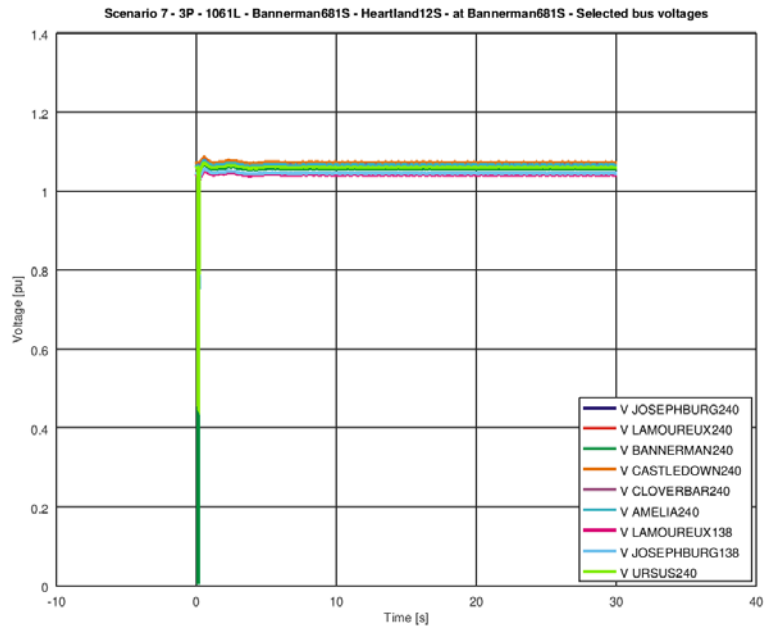


Figure A-752 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

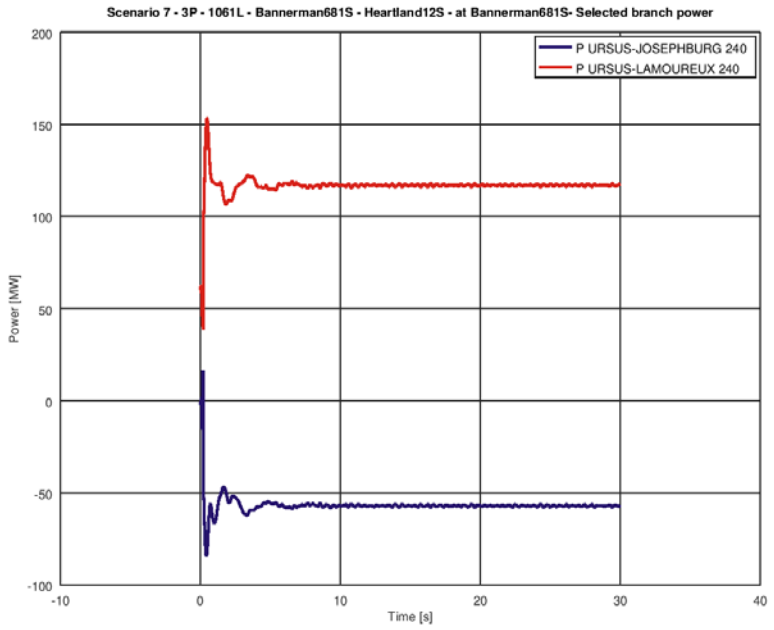


Figure A-753 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

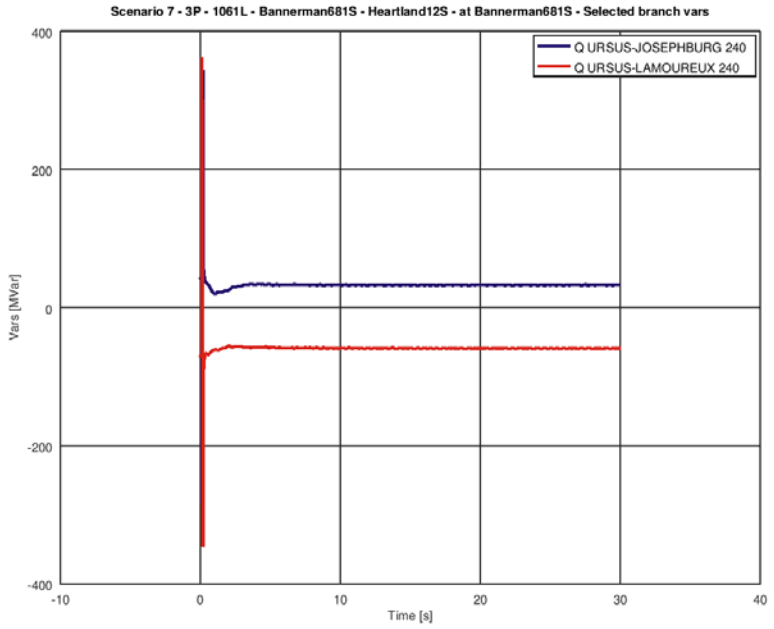


Figure A-754 Scenario 7 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

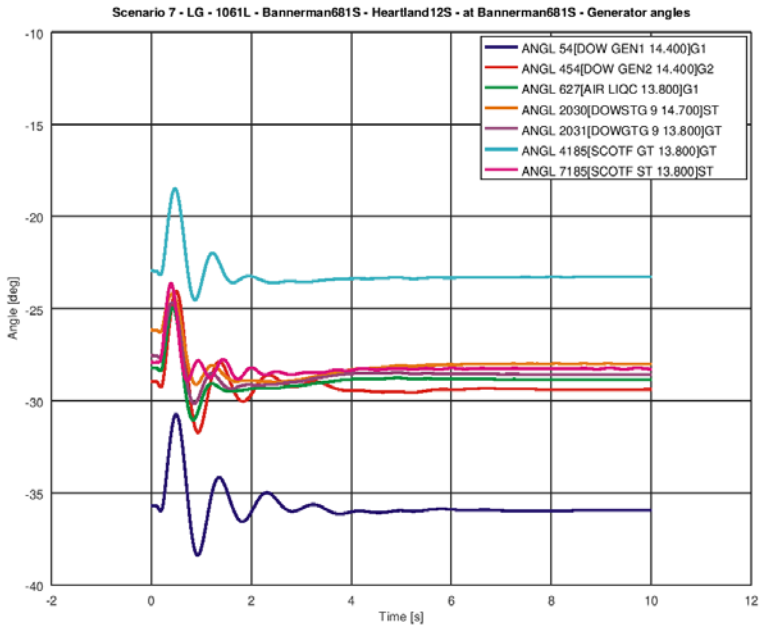


Figure A-755 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

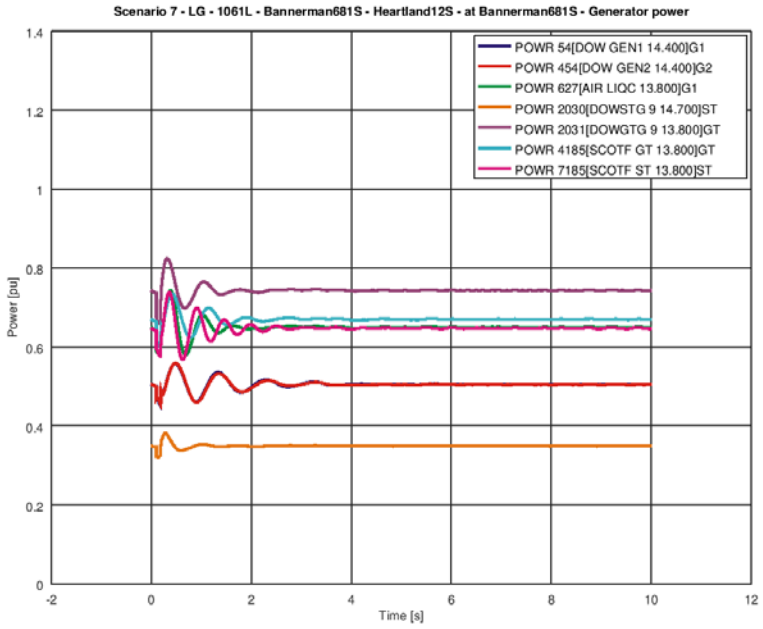


Figure A-756 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

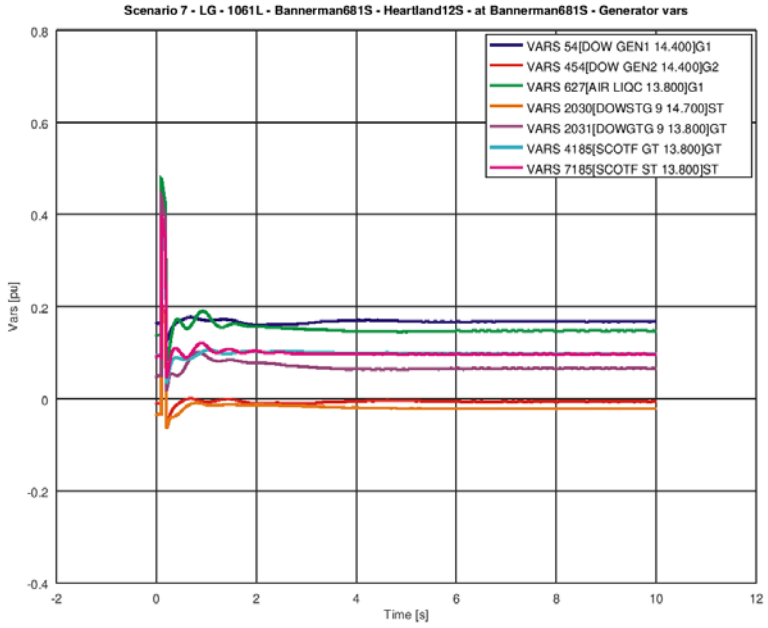


Figure A-757 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

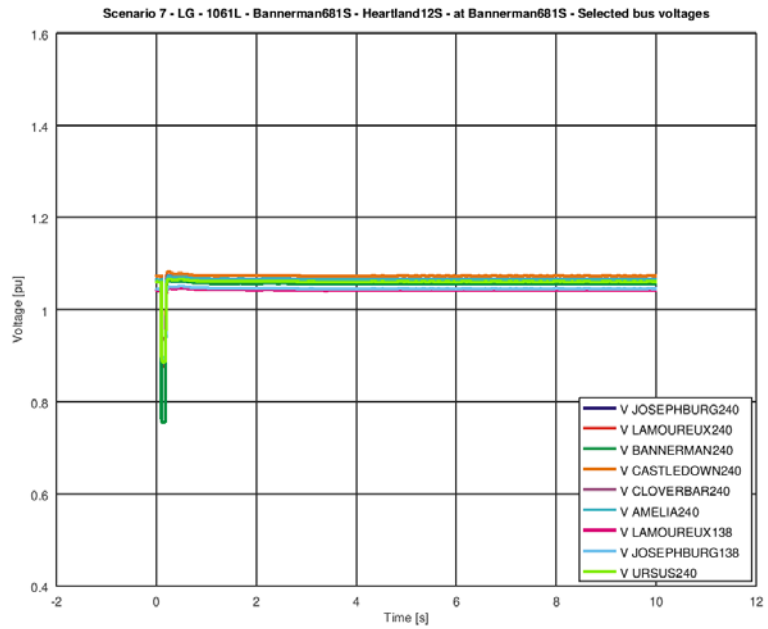


Figure A-758 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

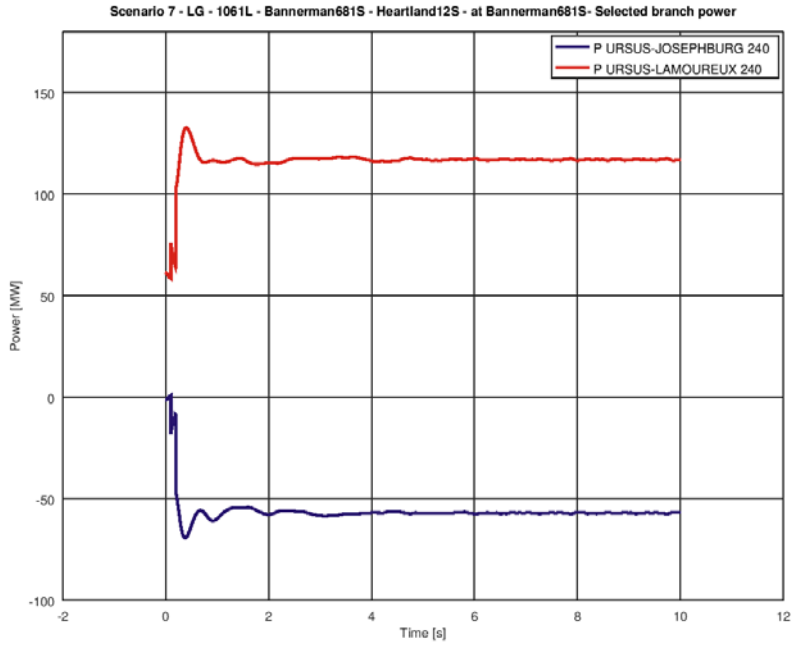


Figure A-759 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

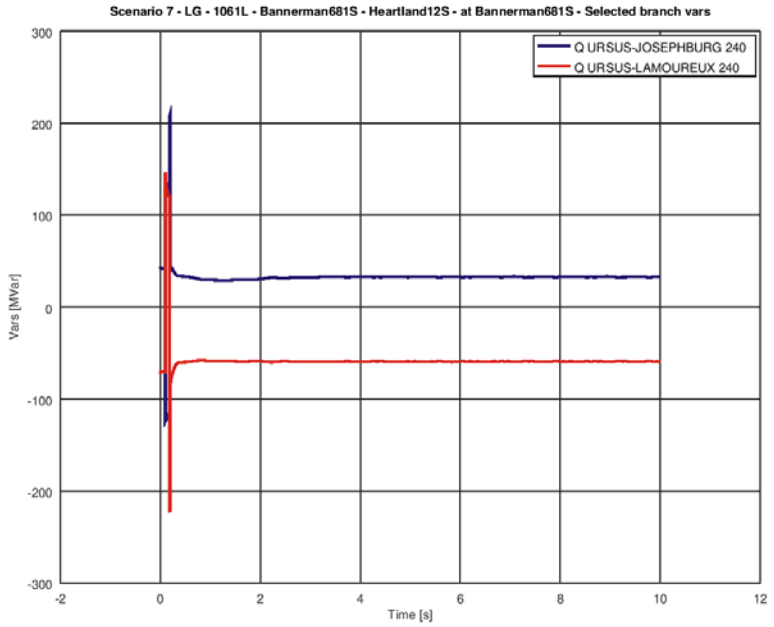


Figure A-760 Scenario 7 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

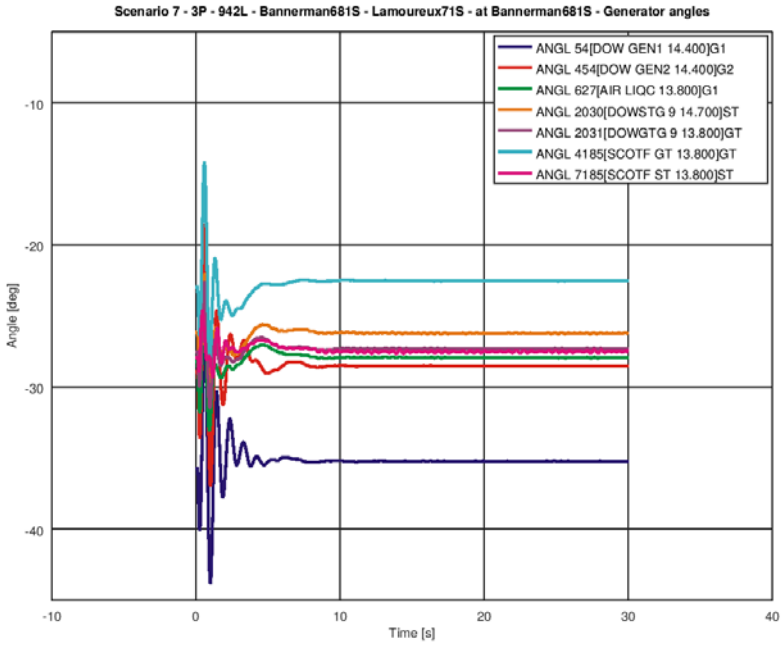


Figure A-761 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

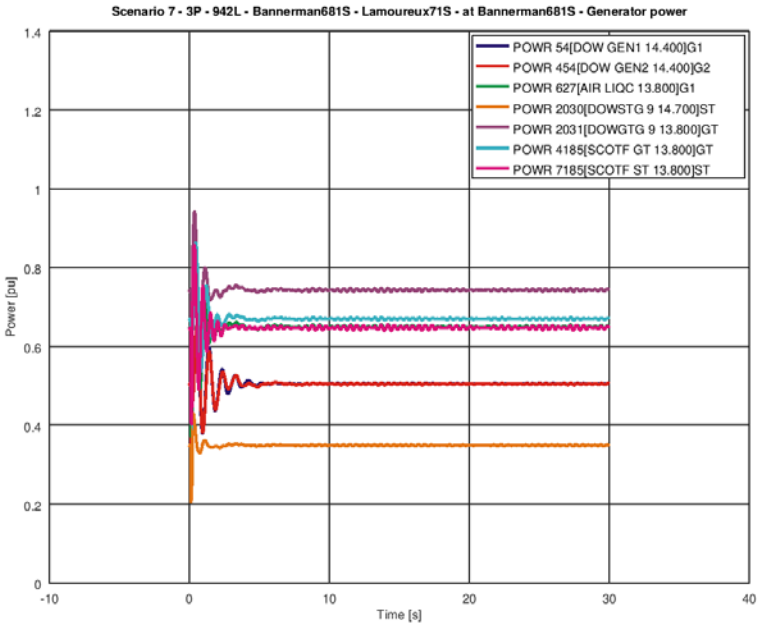


Figure A-762 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

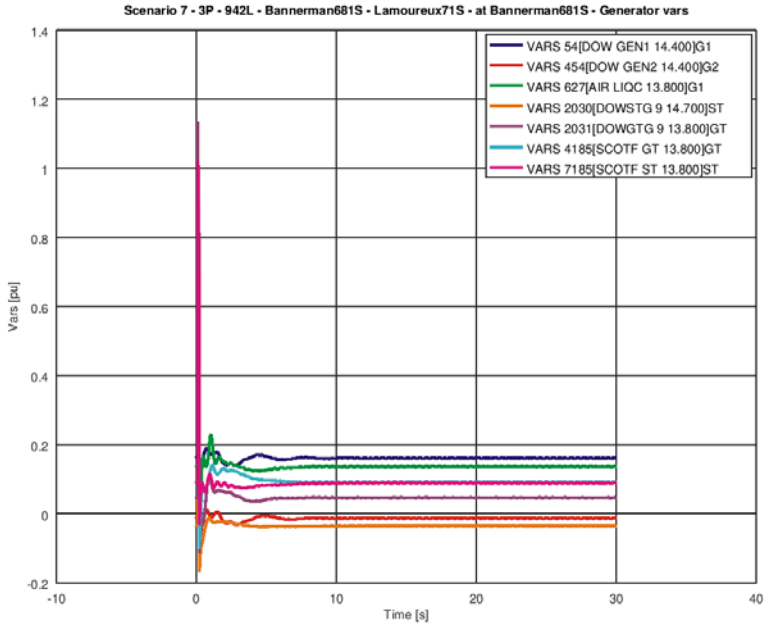


Figure A-763 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

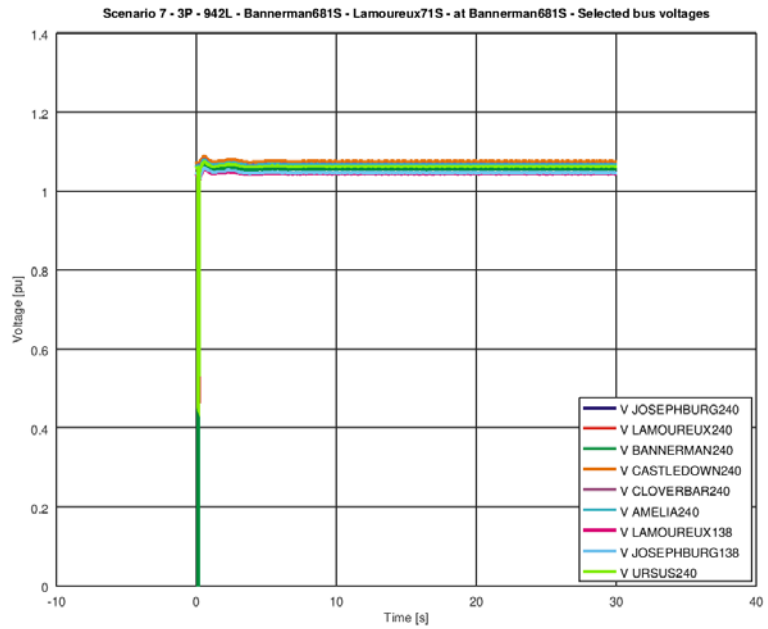


Figure A-764 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

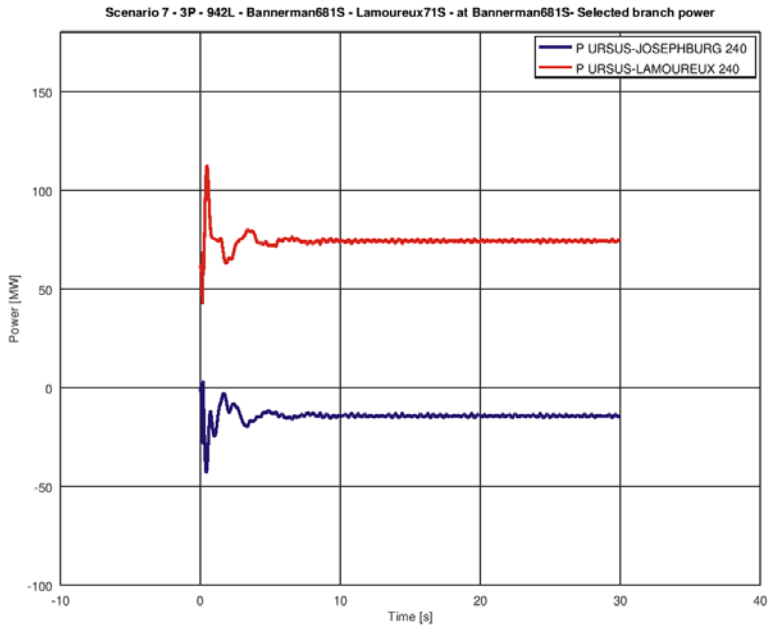


Figure A-765 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

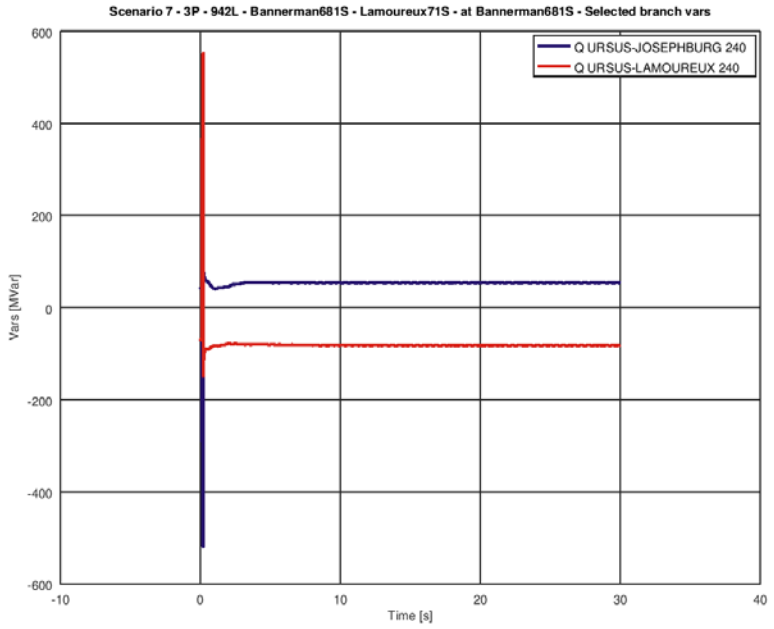


Figure A-766 Scenario 7 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

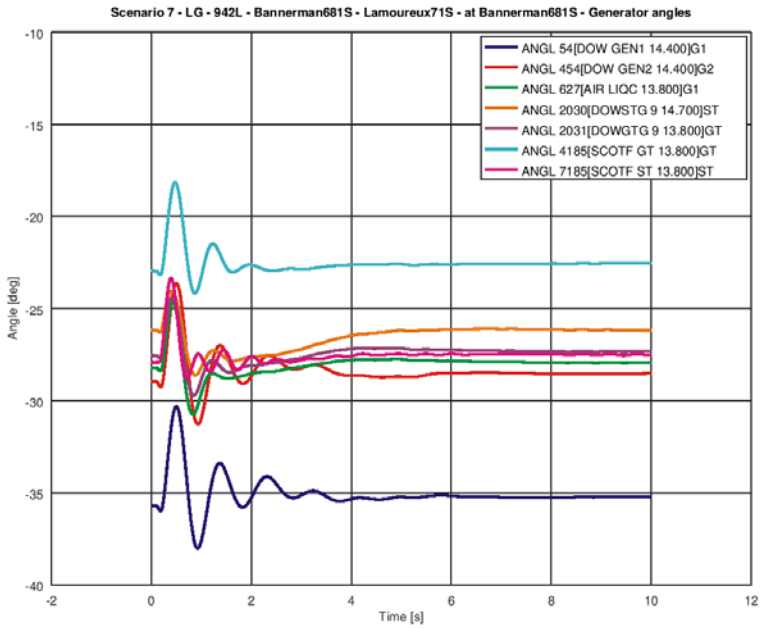


Figure A-767 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

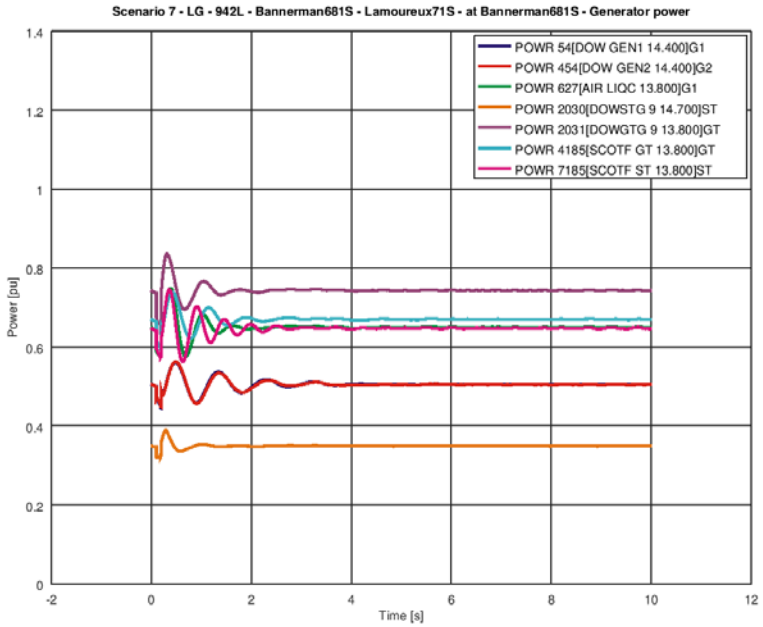


Figure A-768 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

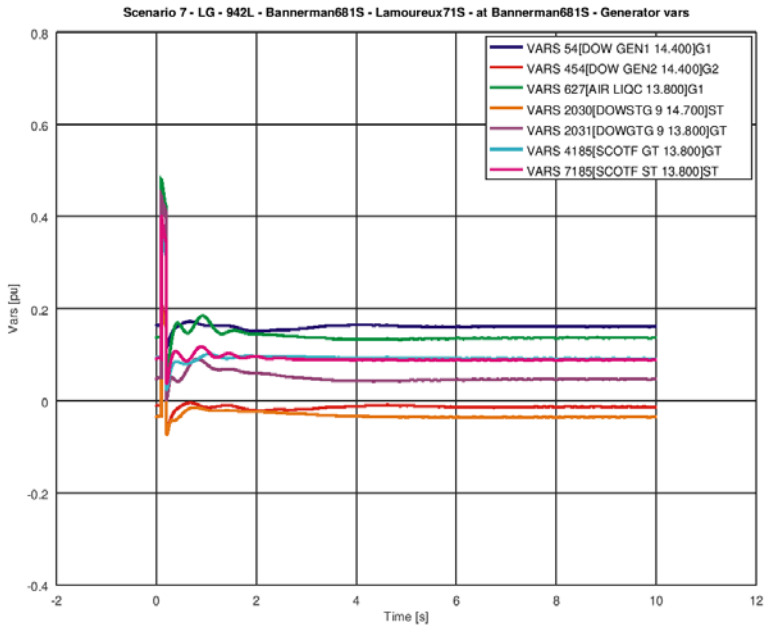


Figure A-769 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

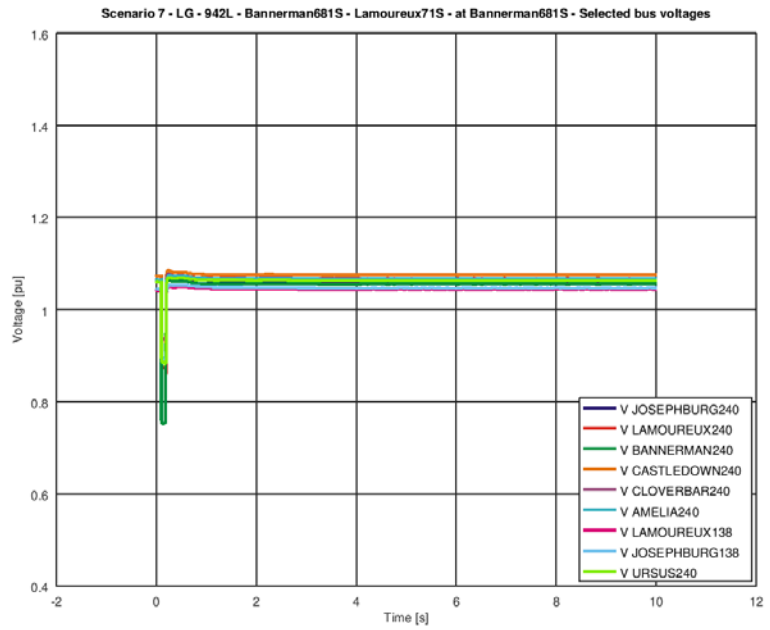


Figure A-770 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

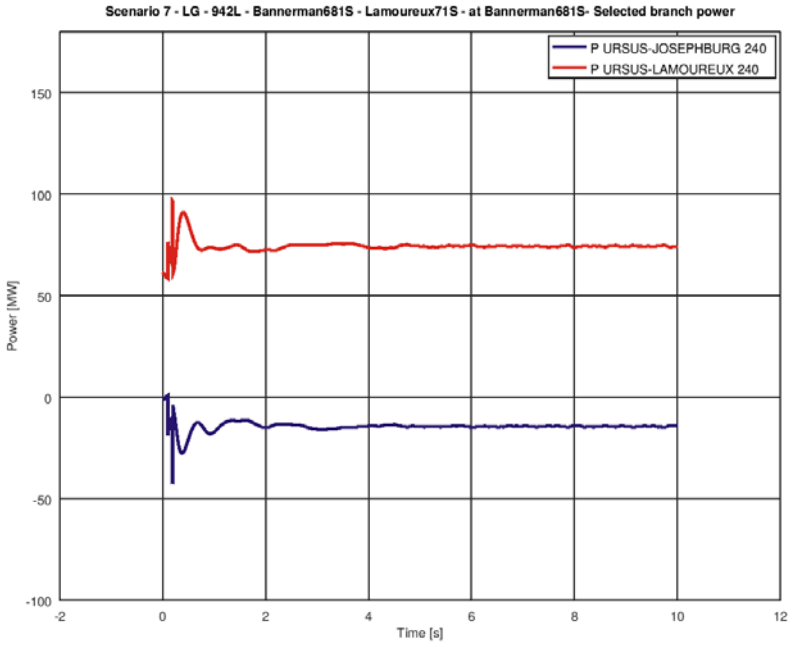


Figure A-771 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

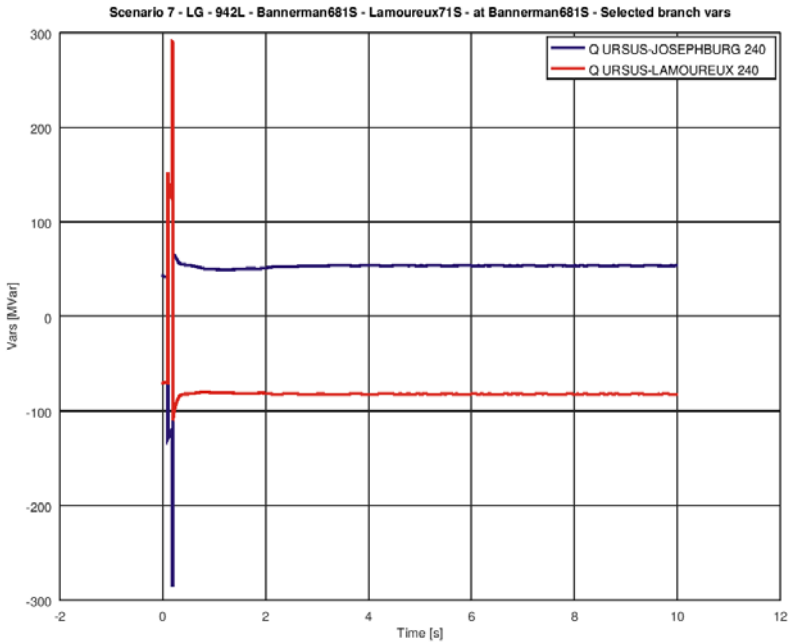


Figure A-772 Scenario 7 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

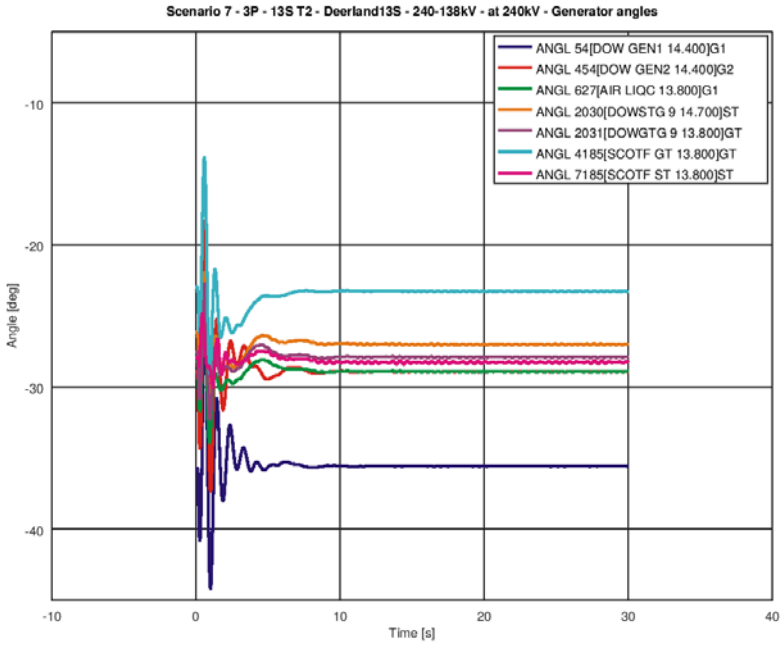


Figure A-773 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator angles

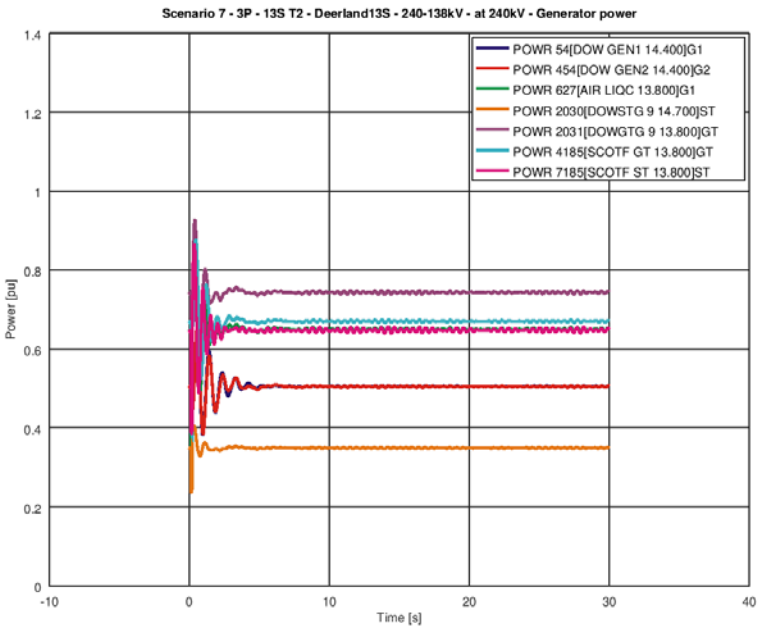


Figure A-774 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator power

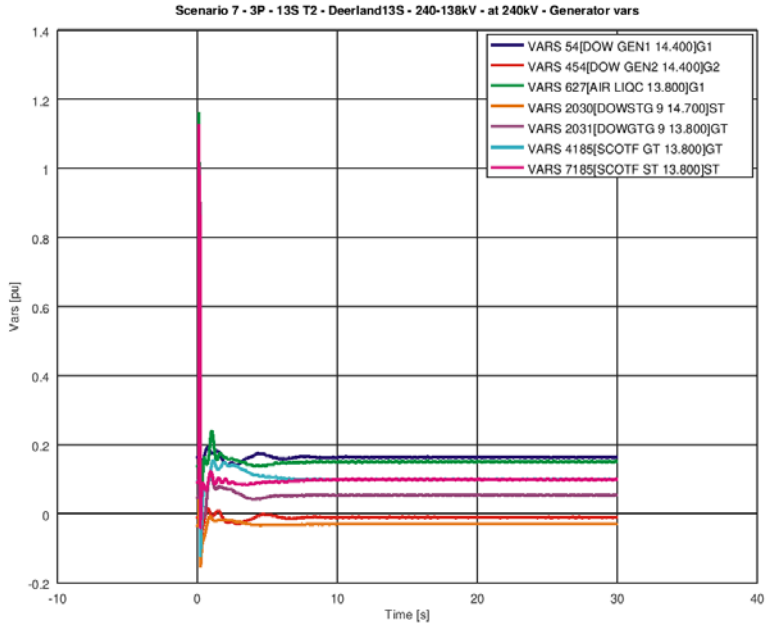


Figure A-775 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator vars

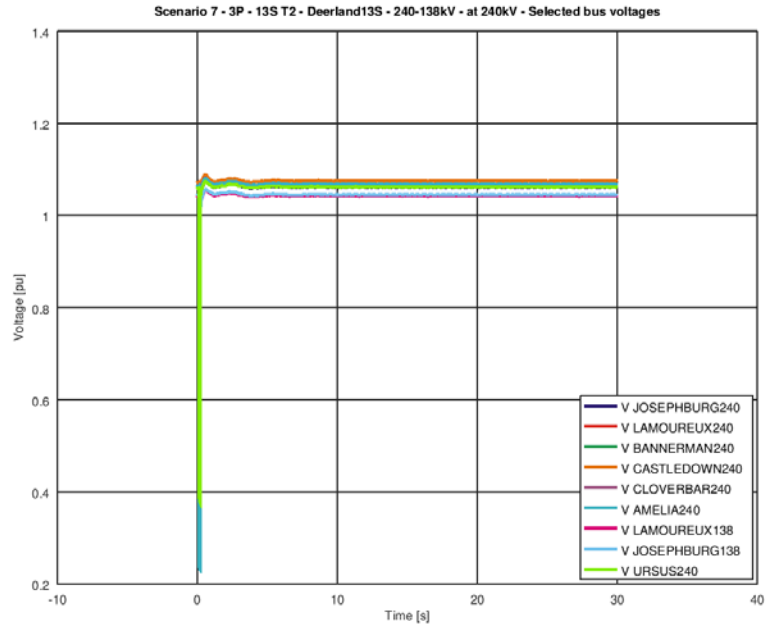


Figure A-776 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected bus voltages

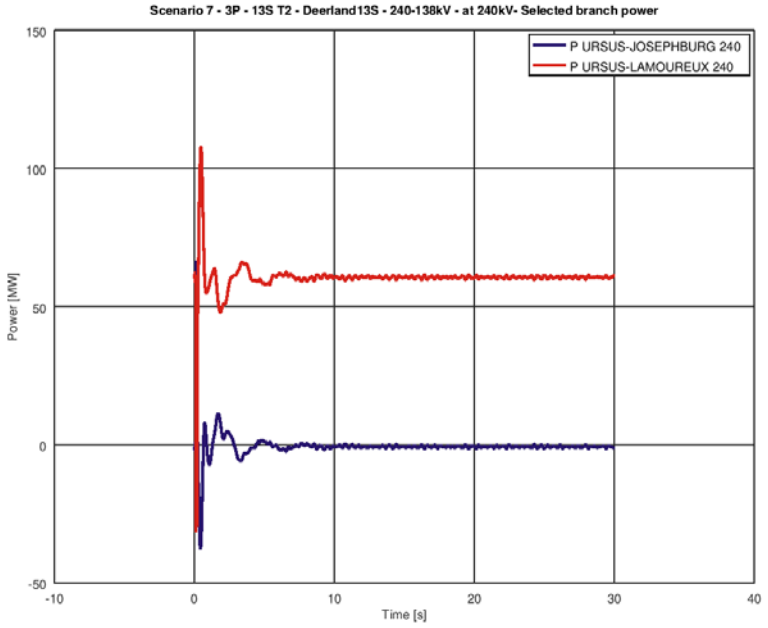


Figure A-777 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected branch power

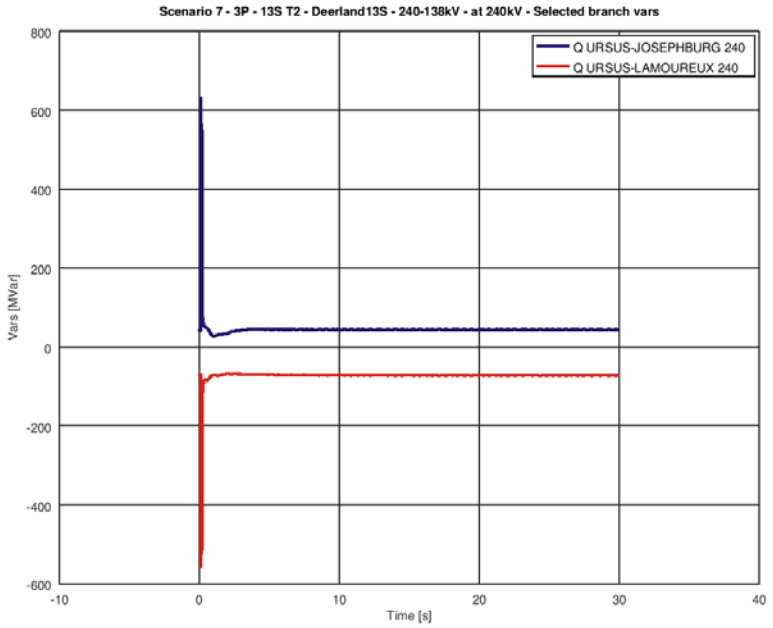


Figure A-778 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected branch vars

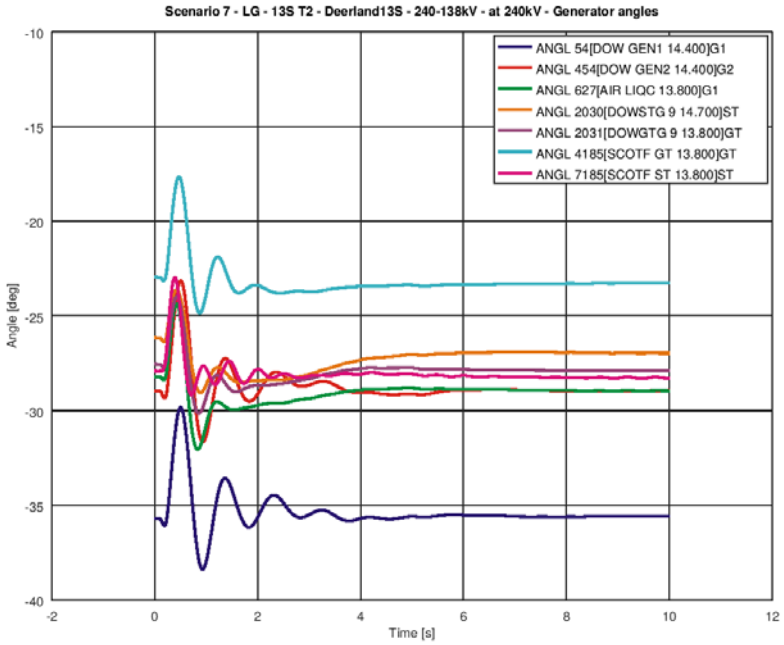


Figure A-779 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator angles

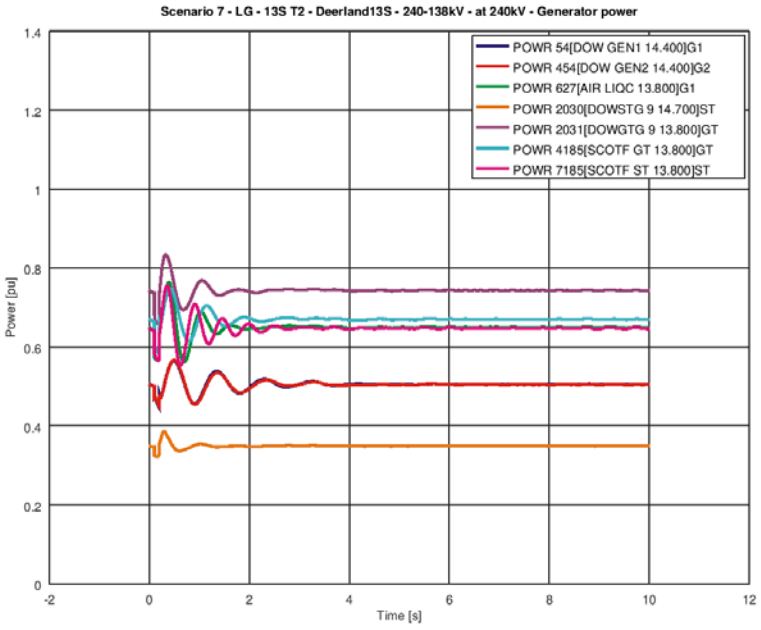


Figure A-780 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator power

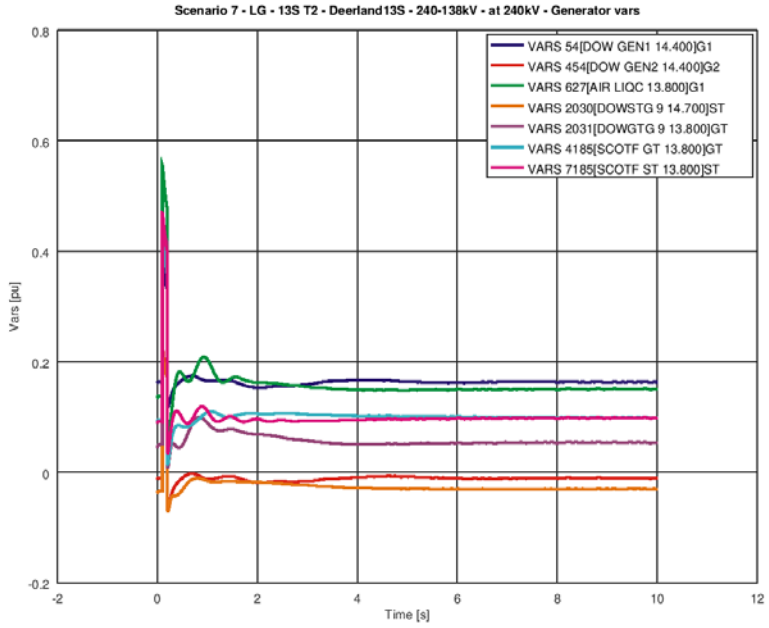


Figure A-781 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Generator vars

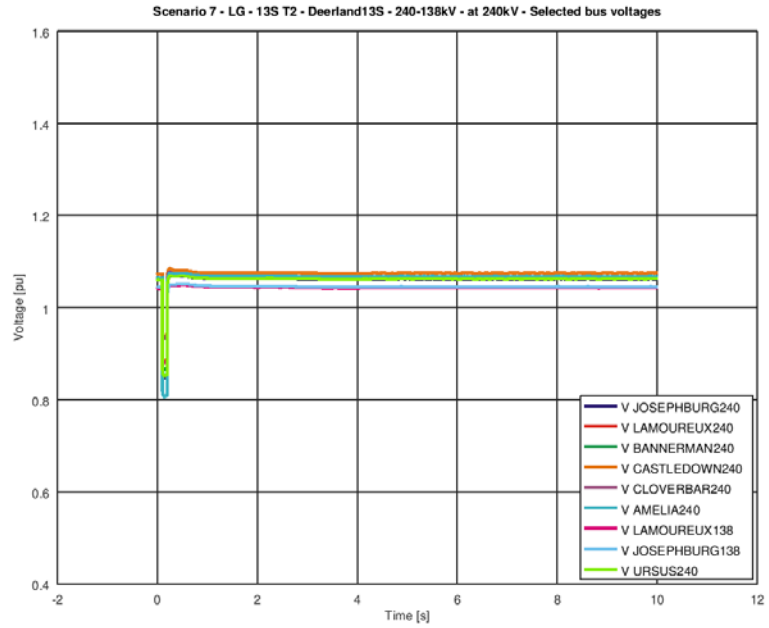


Figure A-782 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected bus voltages

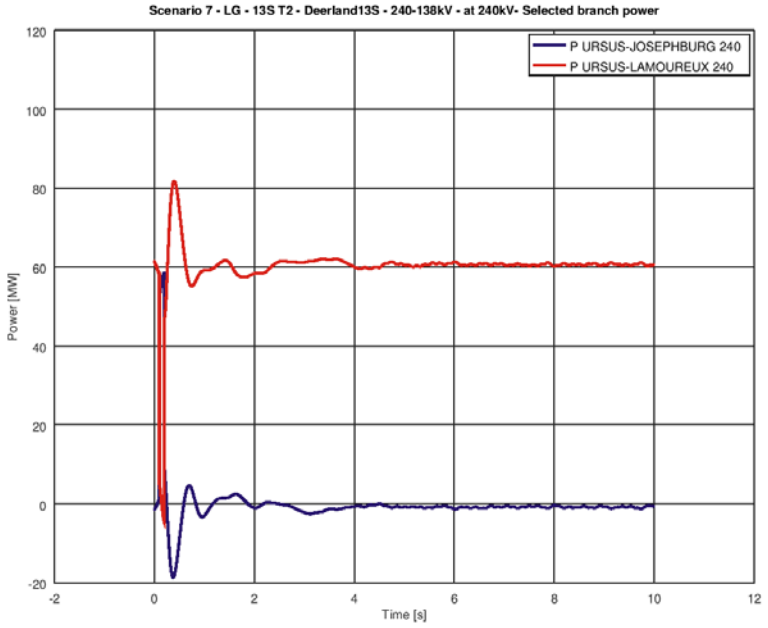


Figure A-783 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected branch power

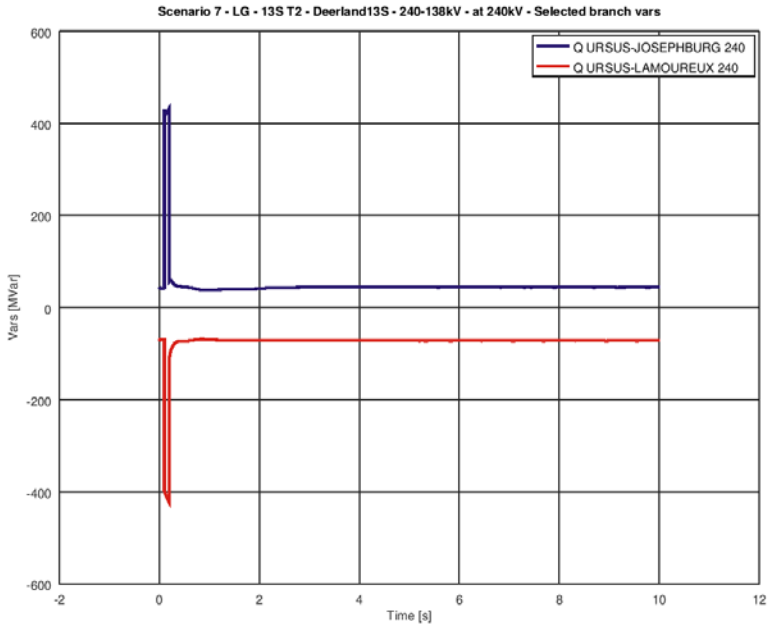


Figure A-784 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (240kV) - Selected branch vars

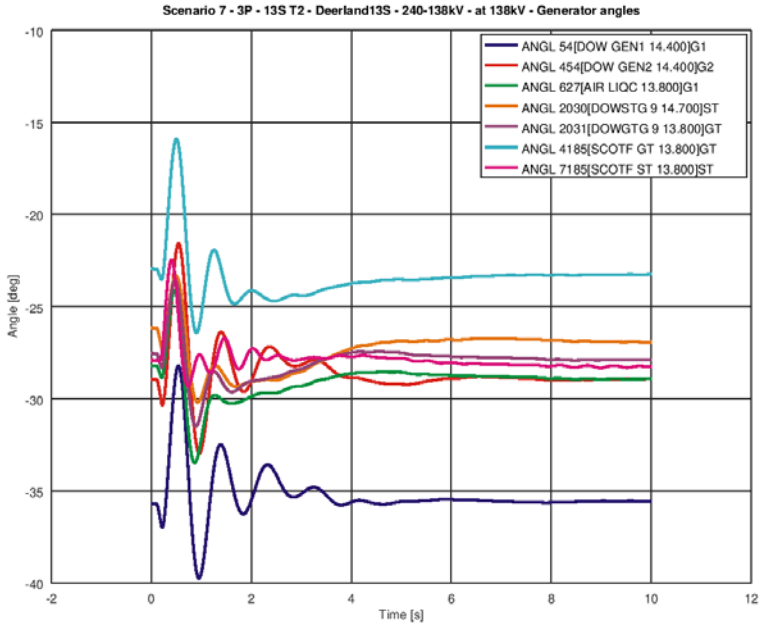


Figure A-785 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator angles

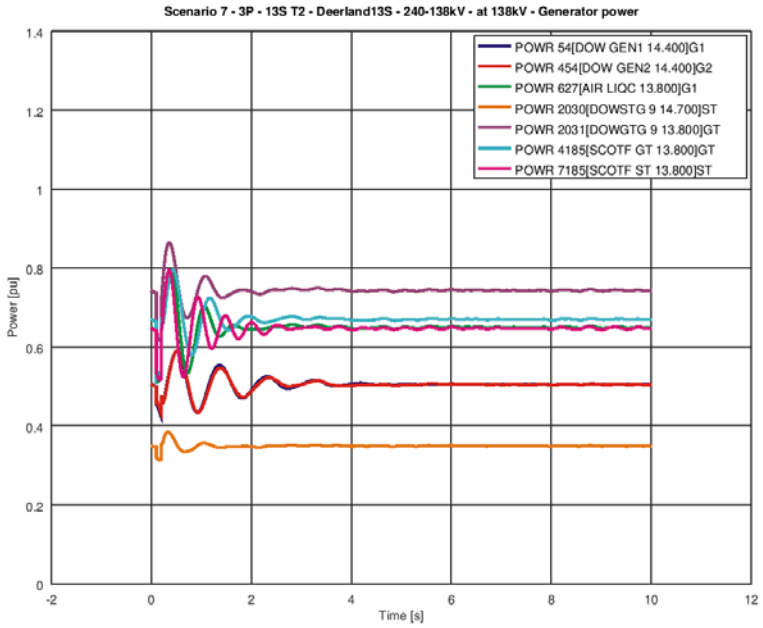


Figure A-786 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator power

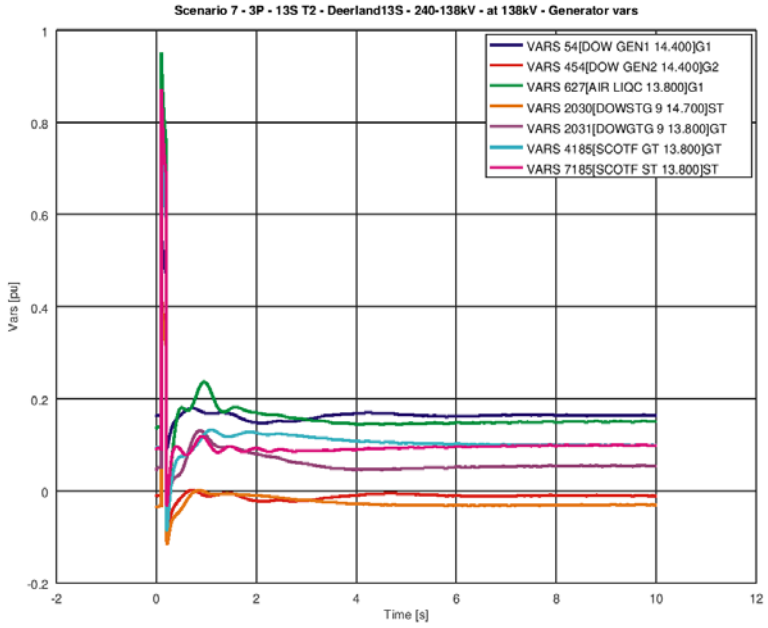


Figure A-787 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator vars

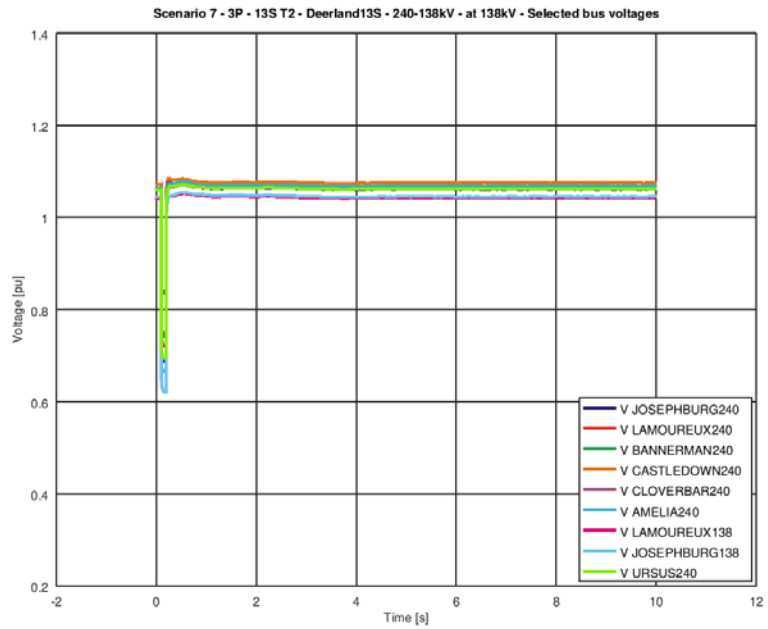


Figure A-788 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected bus voltages

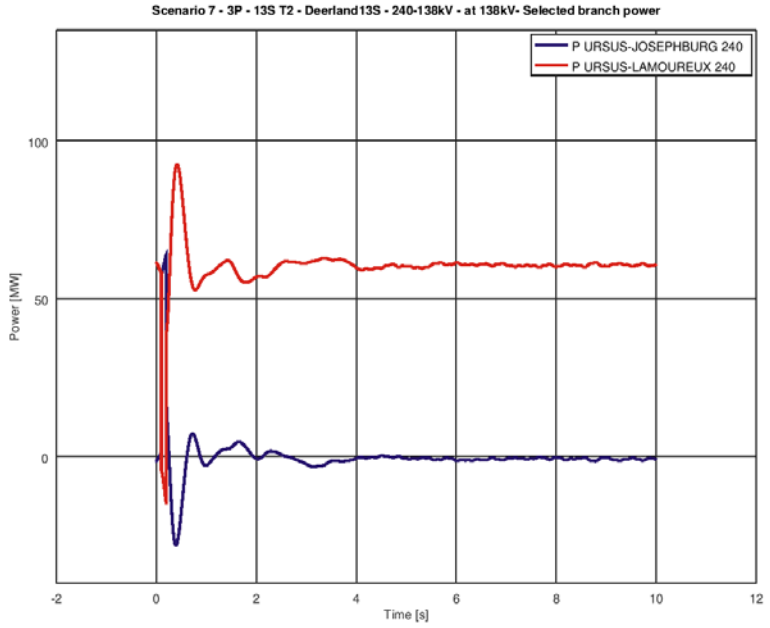


Figure A-789 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected branch power

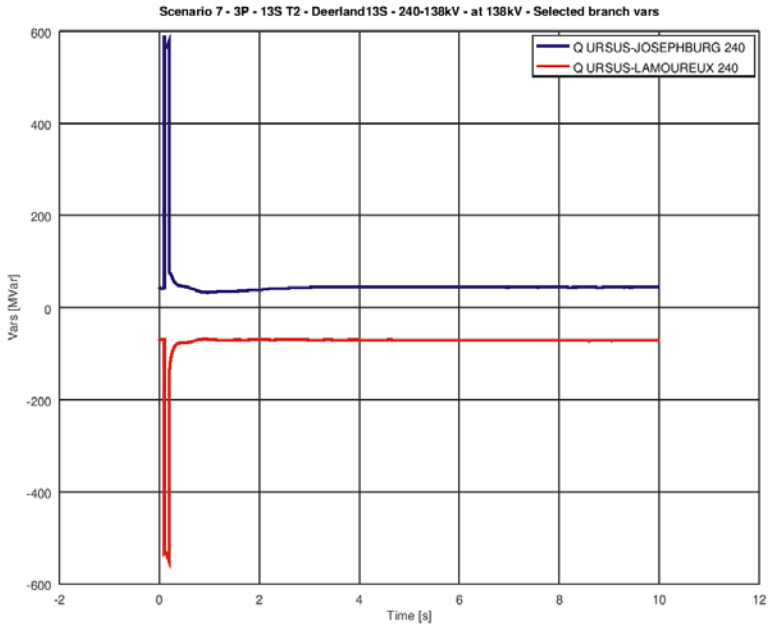


Figure A-790 Scenario 7 - 3P - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected branch vars

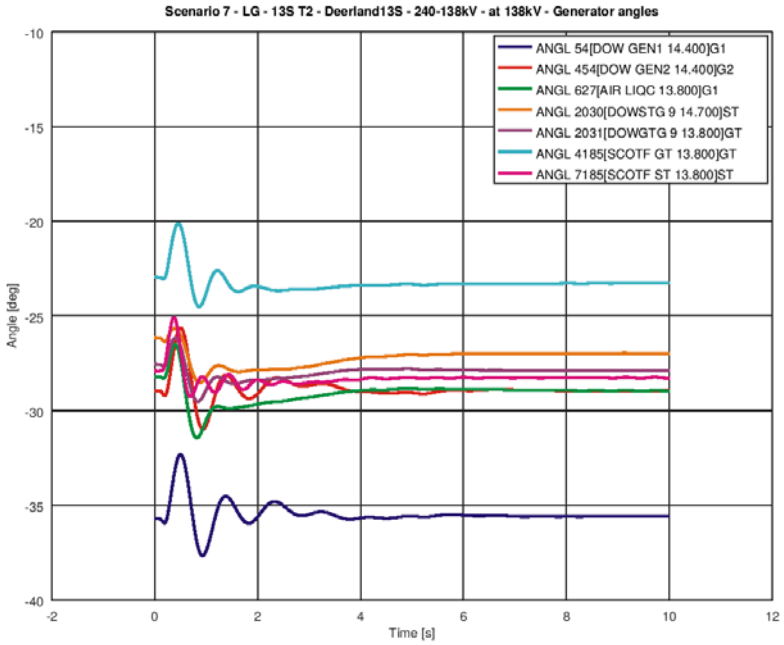


Figure A-791 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator angles

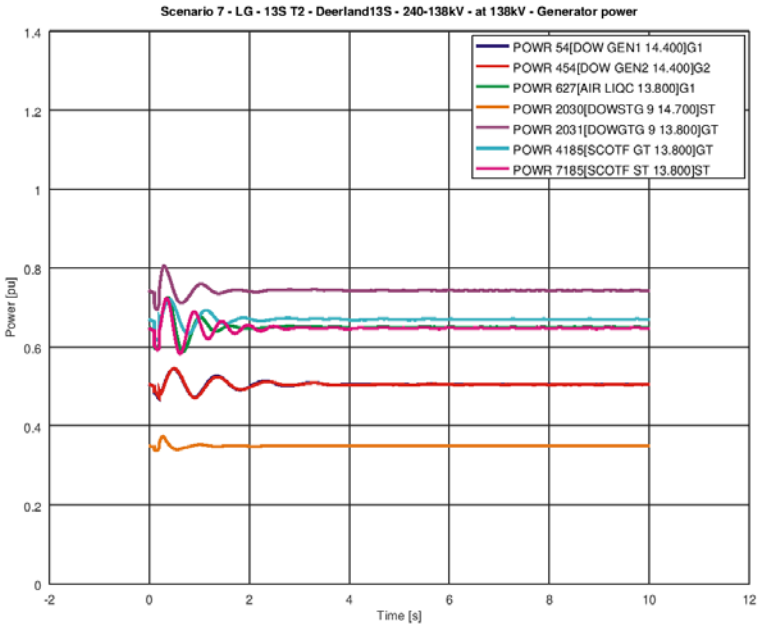


Figure A-792 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator power

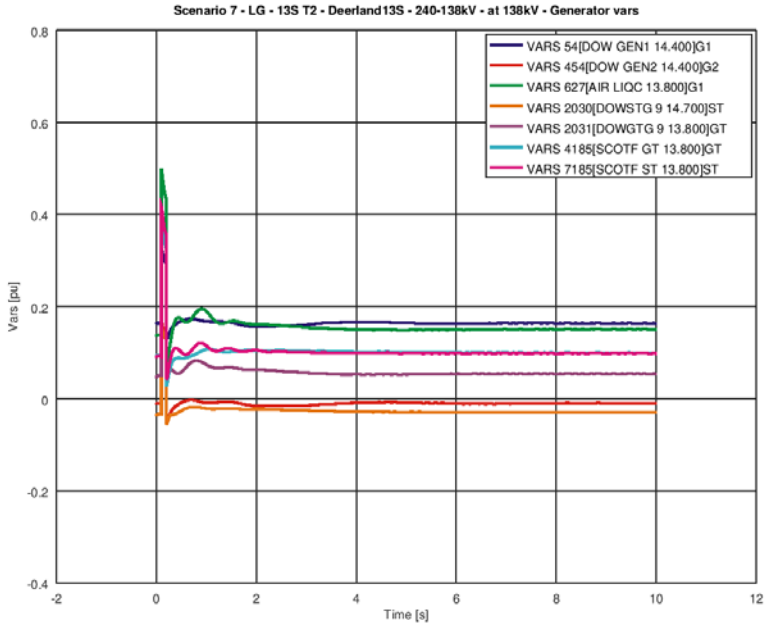


Figure A-793 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Generator vars

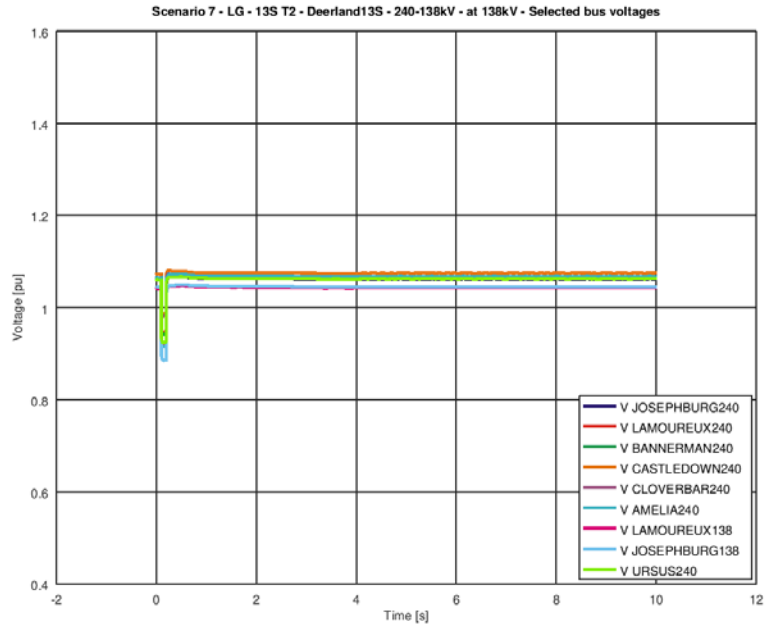


Figure A-794 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected bus voltages

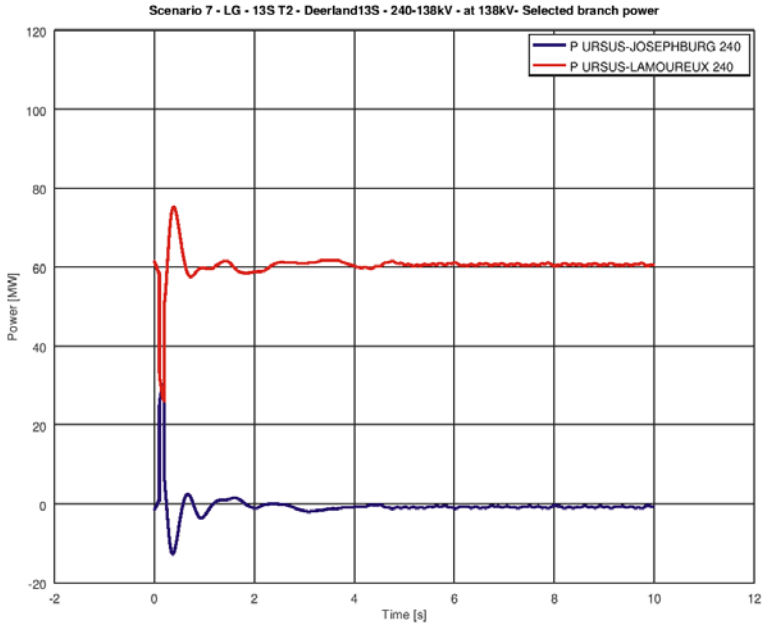


Figure A-795 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected branch power

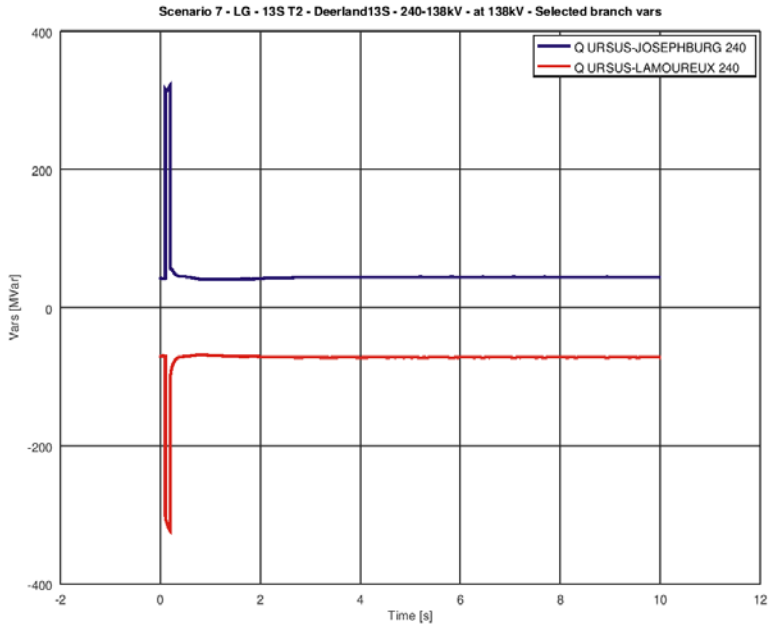


Figure A-796 Scenario 7 - LG - 13S T2 - Deerland13S - 240-138kV - at (138kV) - Selected branch vars

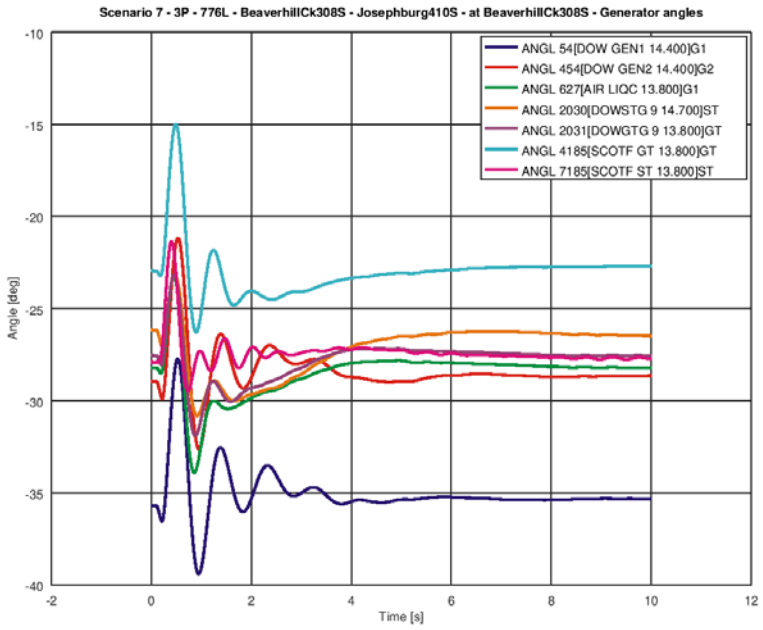


Figure A-797 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

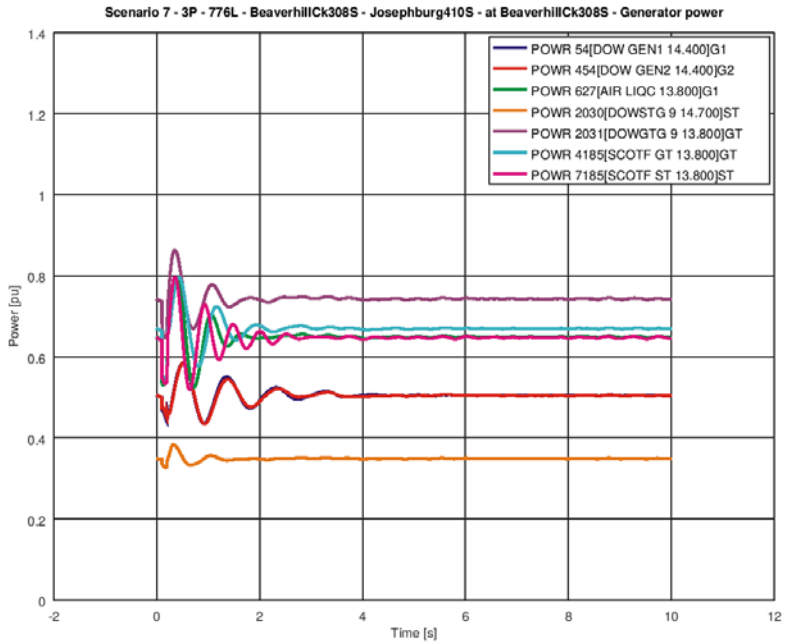


Figure A-798 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

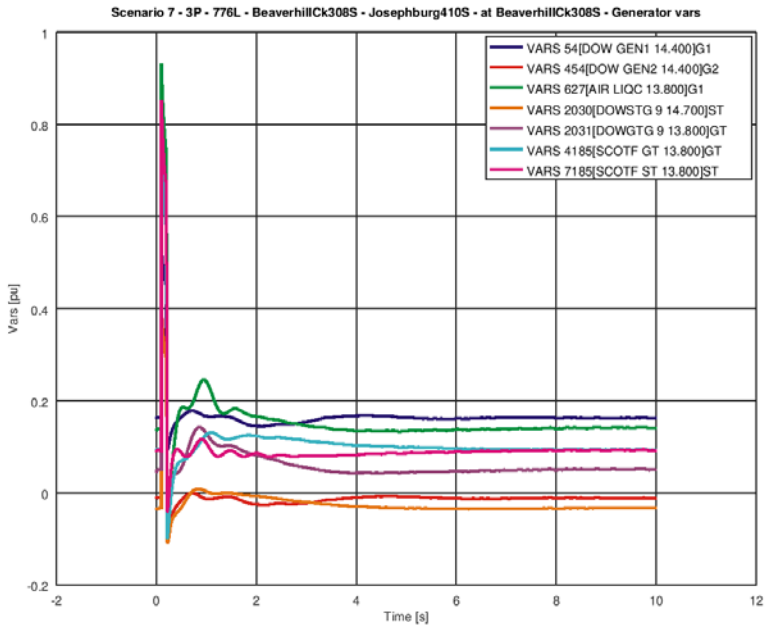


Figure A-799 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

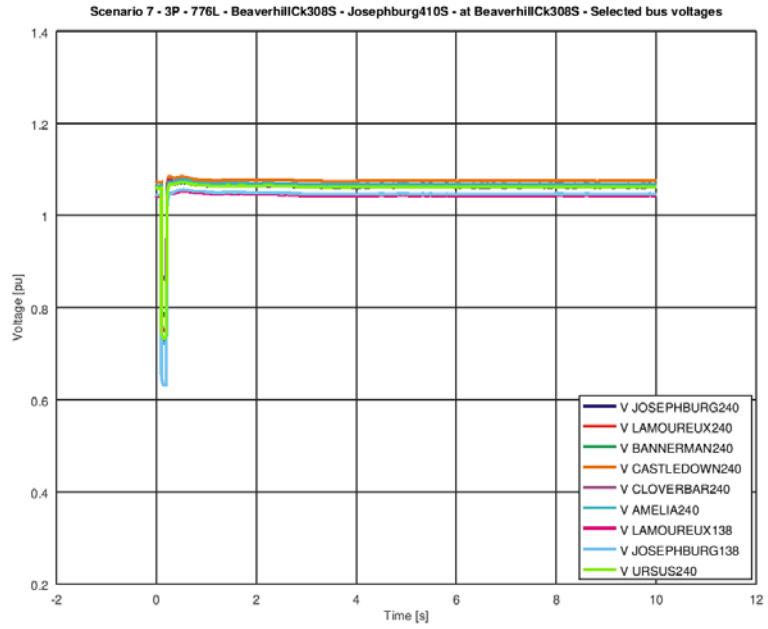


Figure A-800 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

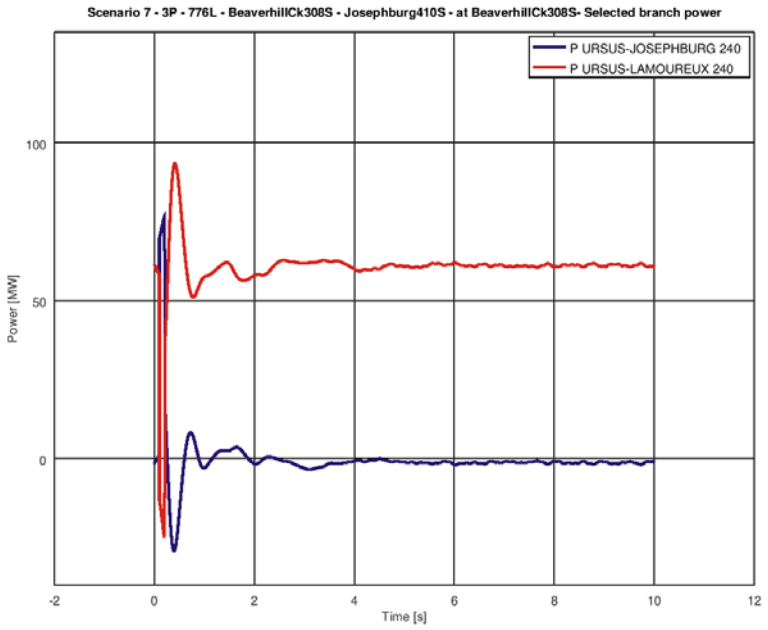


Figure A-801 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

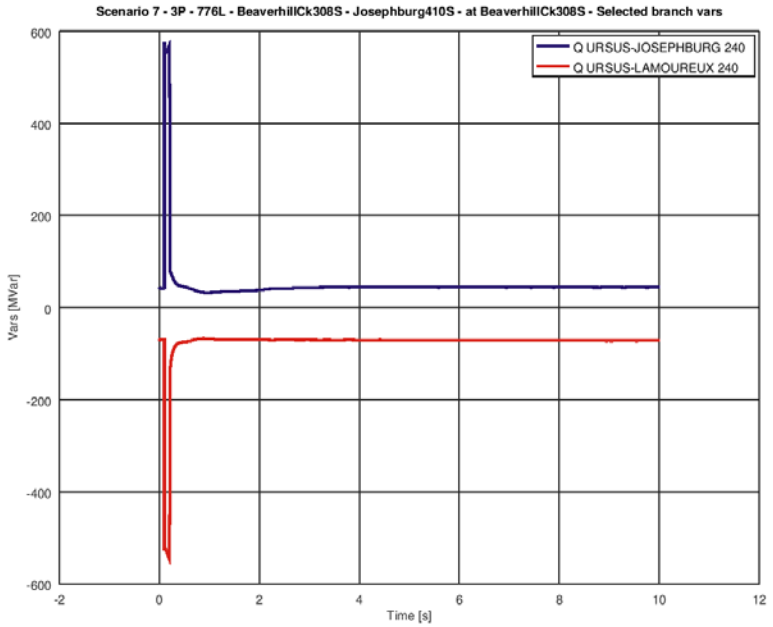


Figure A-802 Scenario 7 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

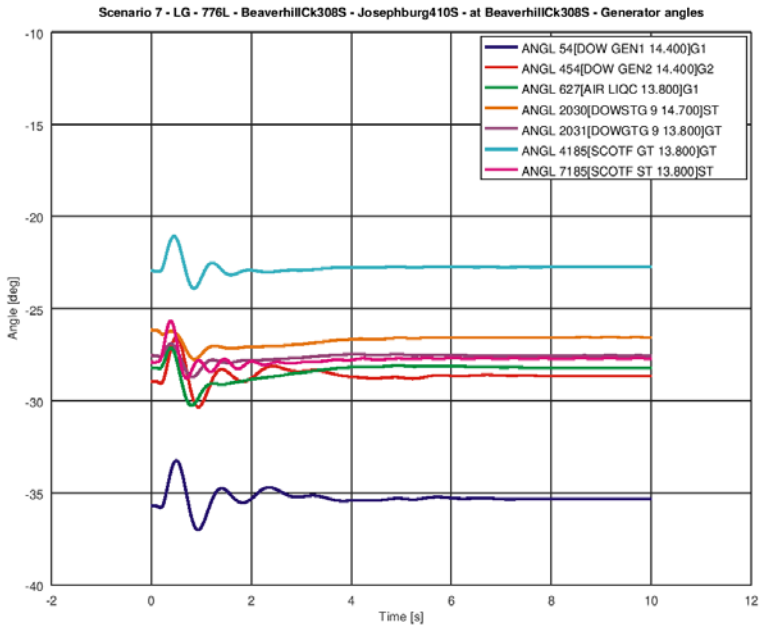


Figure A-803 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

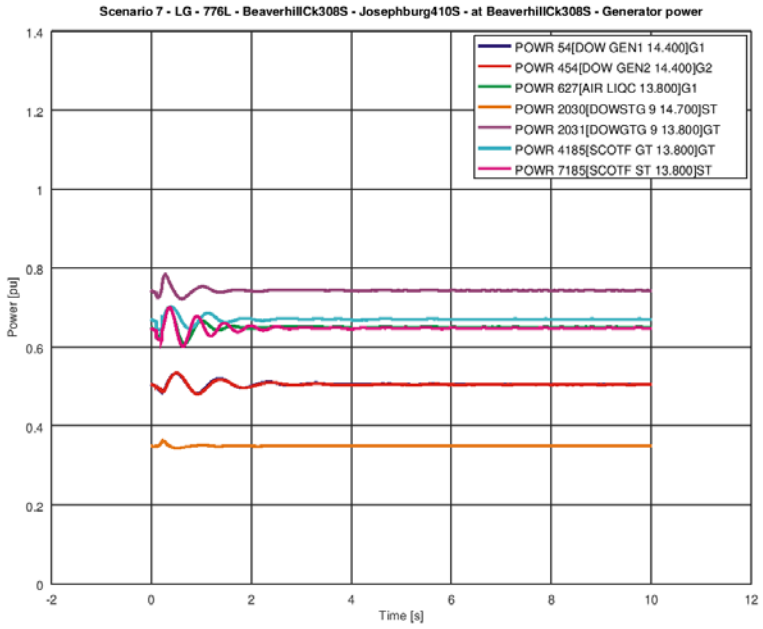


Figure A-804 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

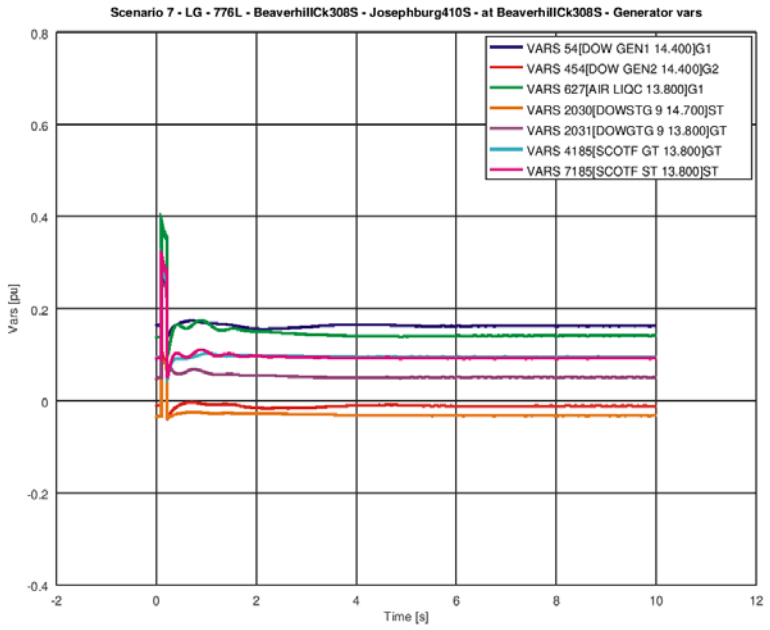


Figure A-805 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

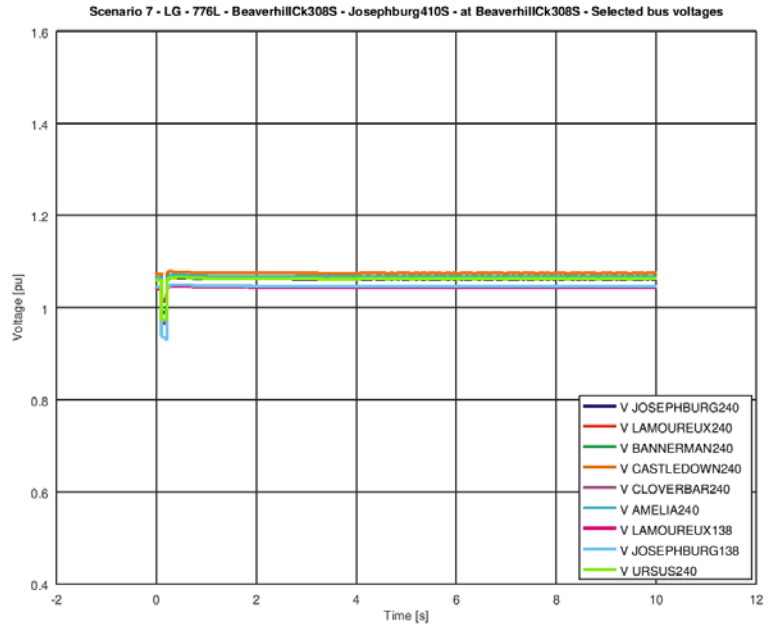


Figure A-806 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

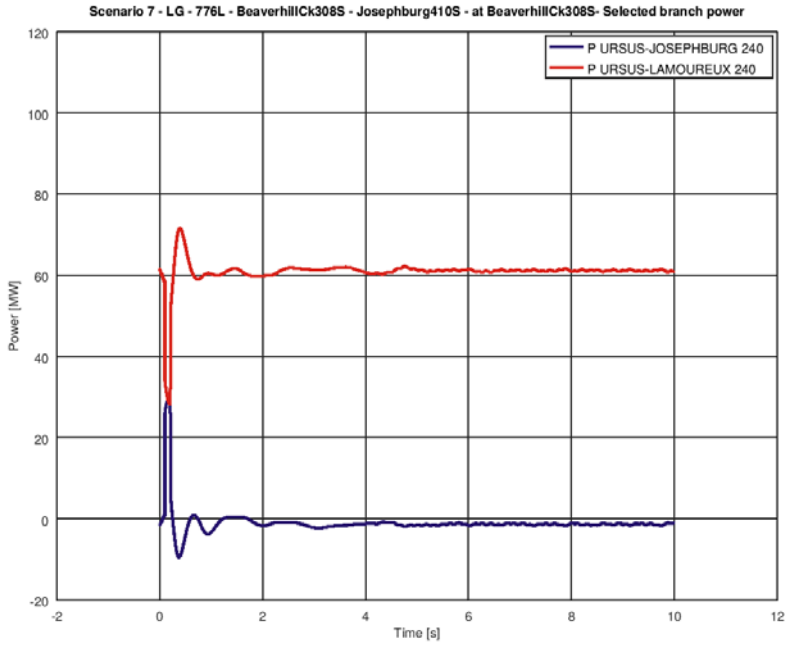


Figure A-807 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

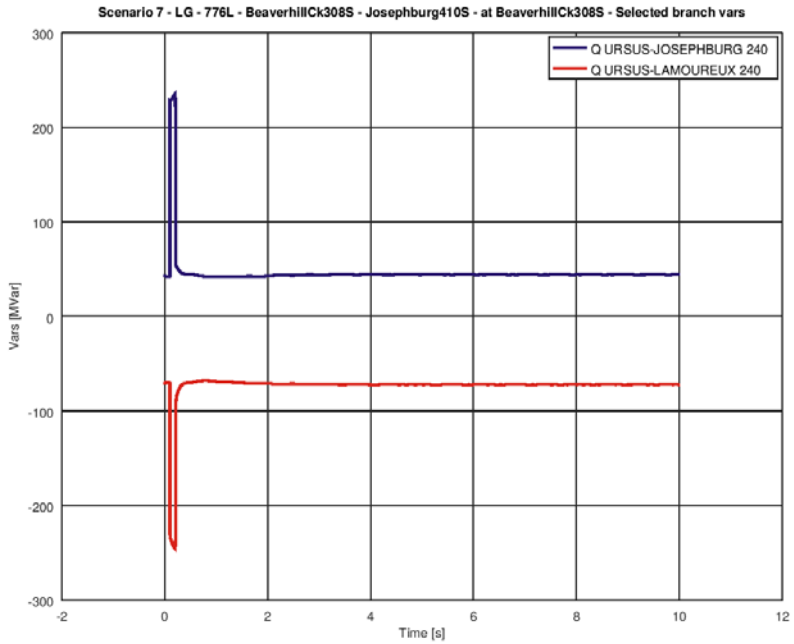


Figure A-808 Scenario 7 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

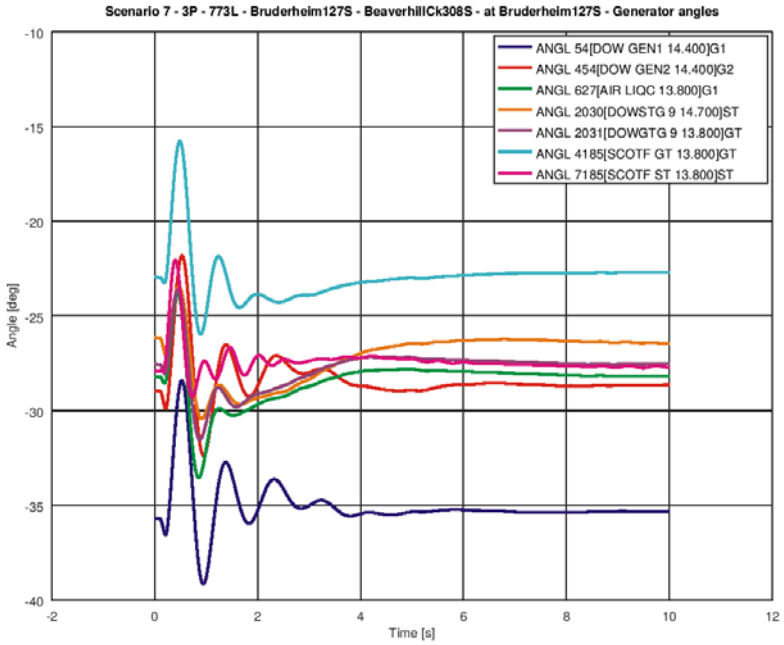


Figure A-809 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

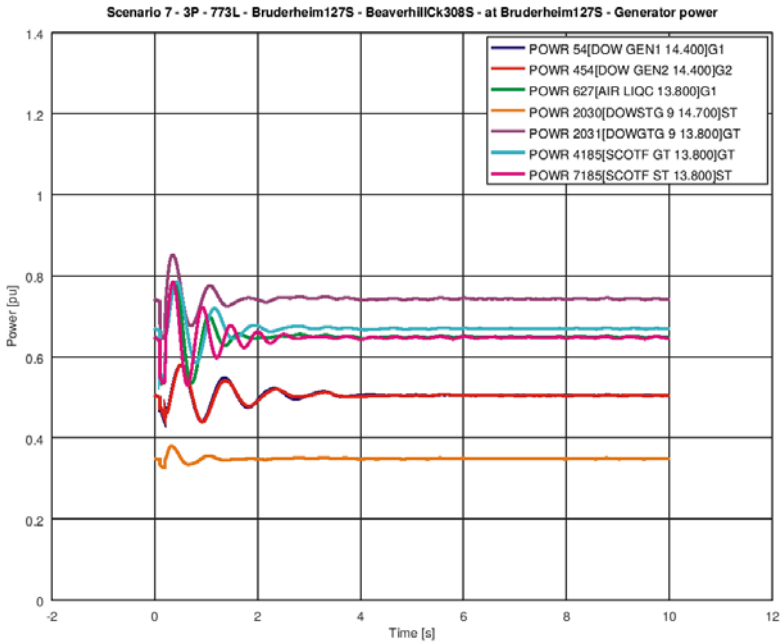


Figure A-810 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

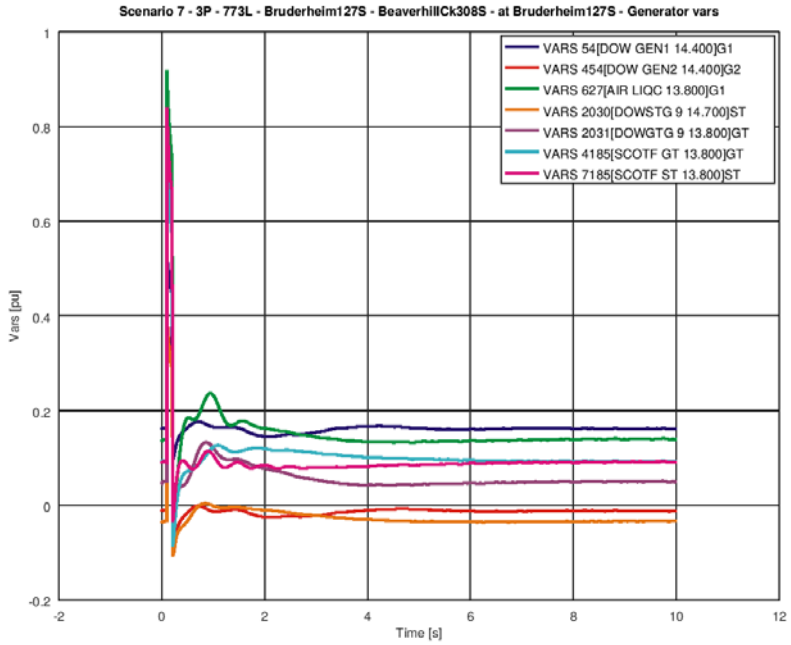


Figure A-811 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

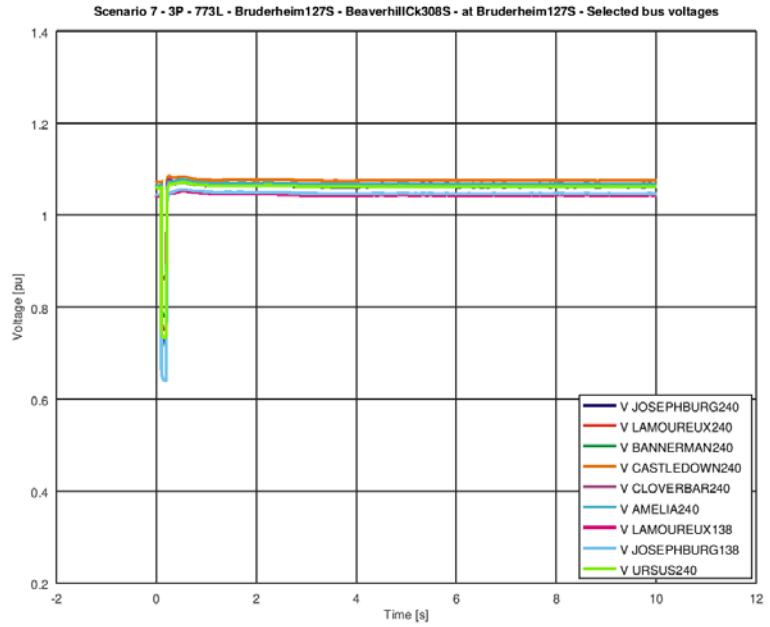


Figure A-812 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

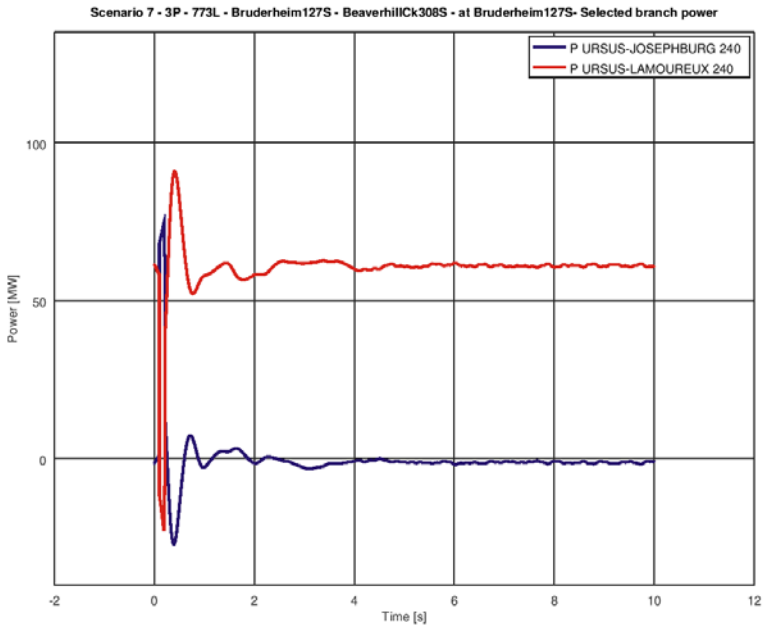


Figure A-813 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

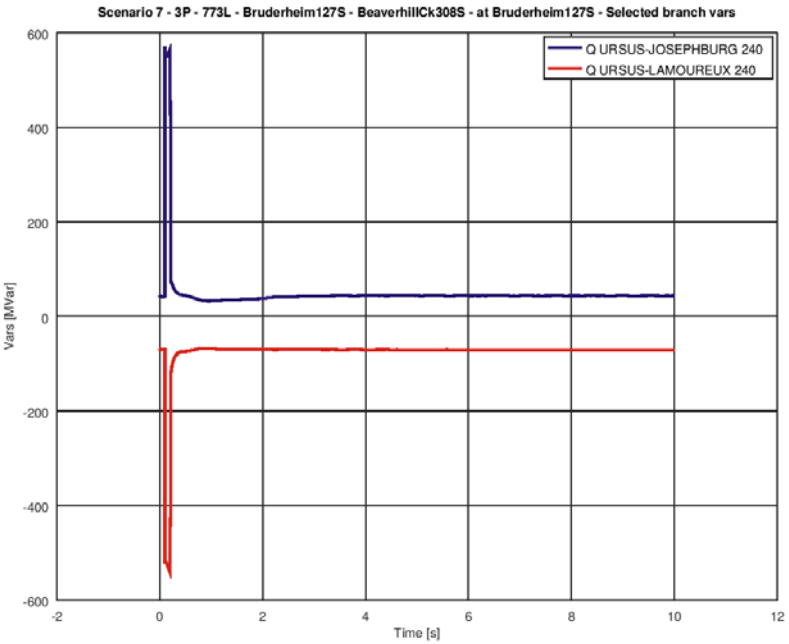


Figure A-814 Scenario 7 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

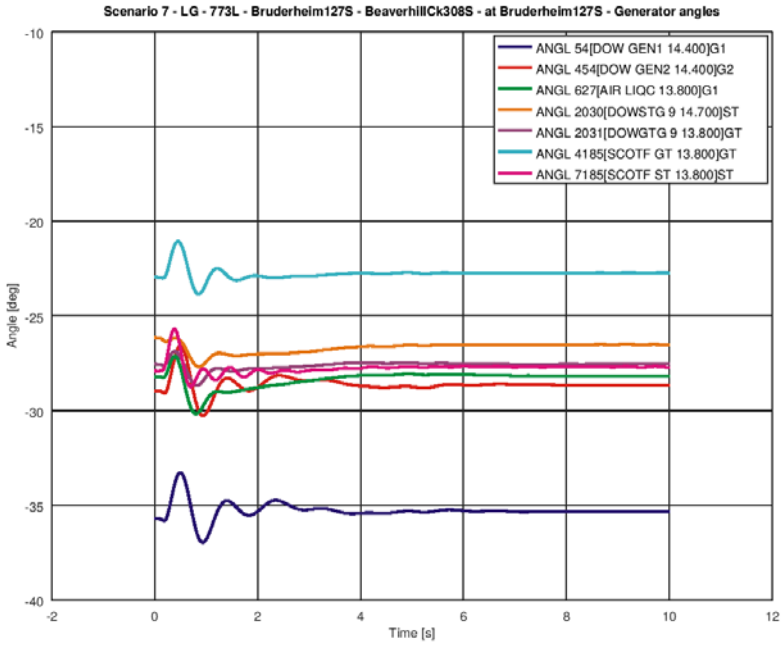


Figure A-815 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

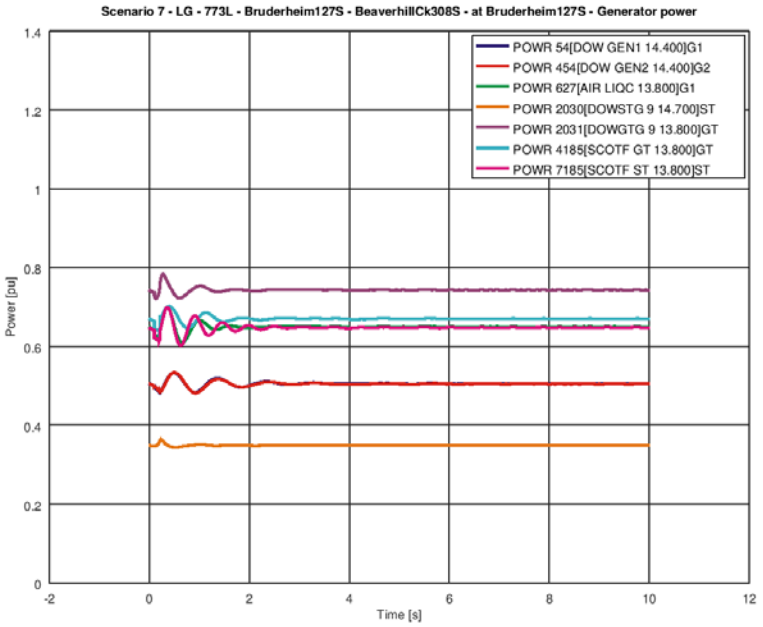


Figure A-816 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

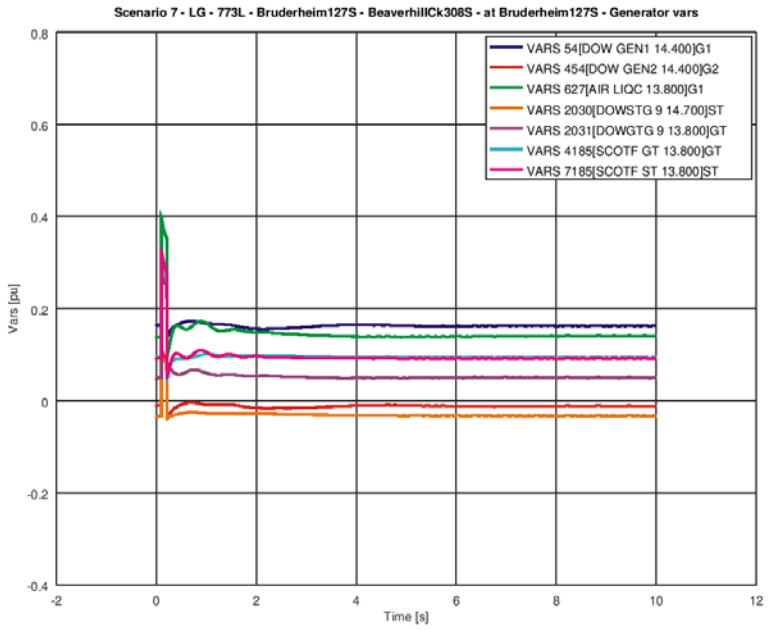


Figure A-817 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

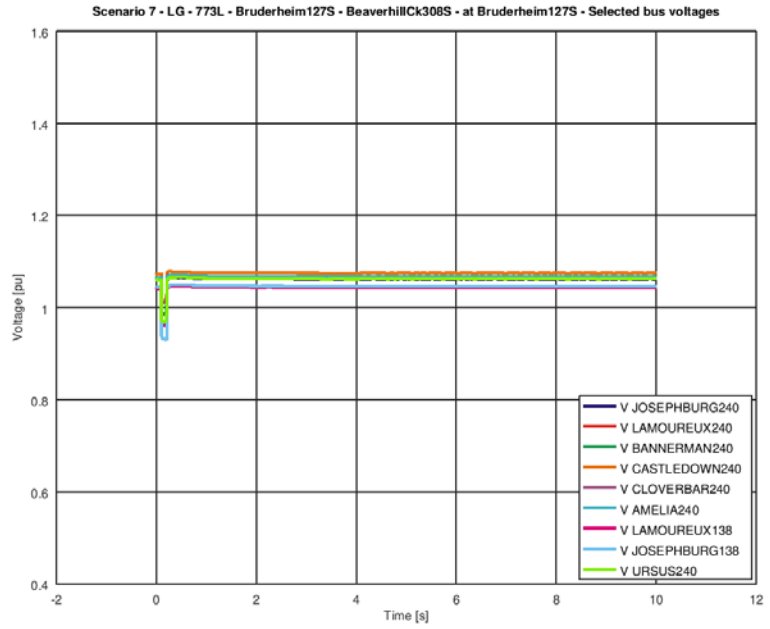


Figure A-818 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

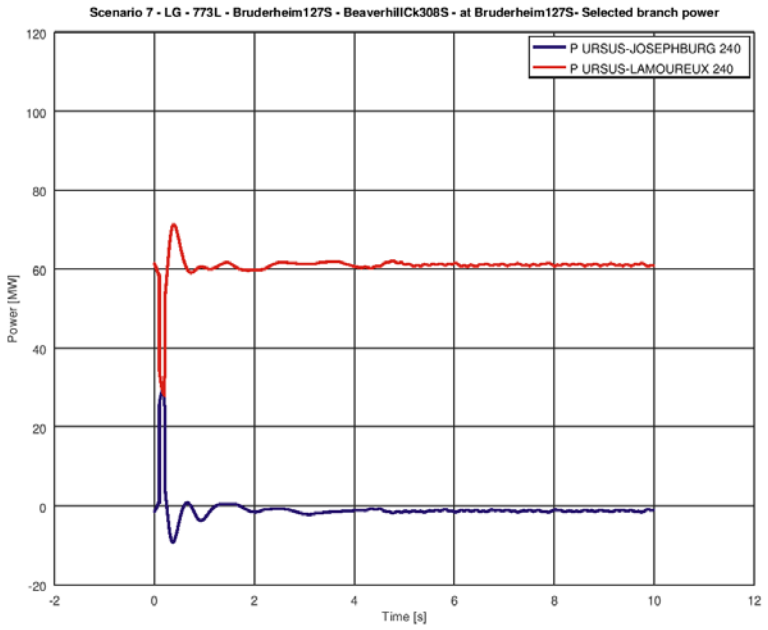


Figure A-819 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

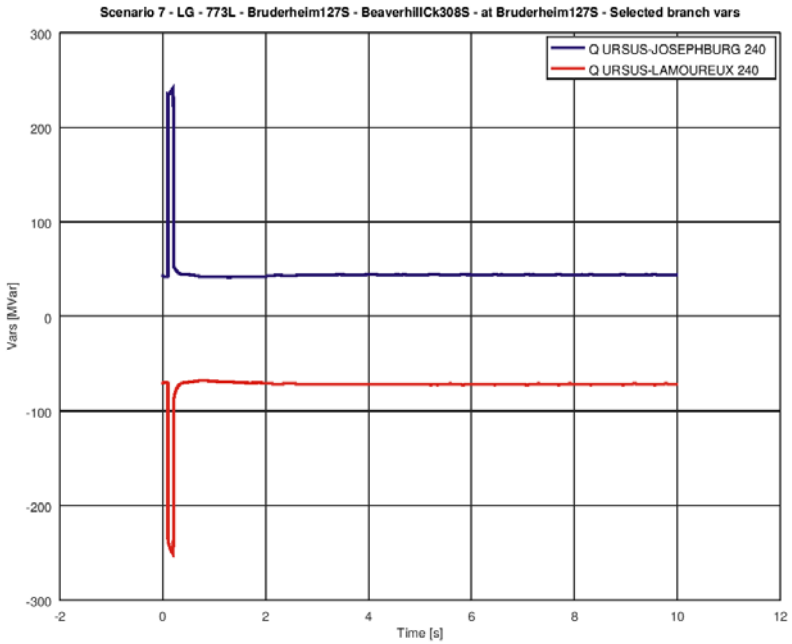


Figure A-820 Scenario 7 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

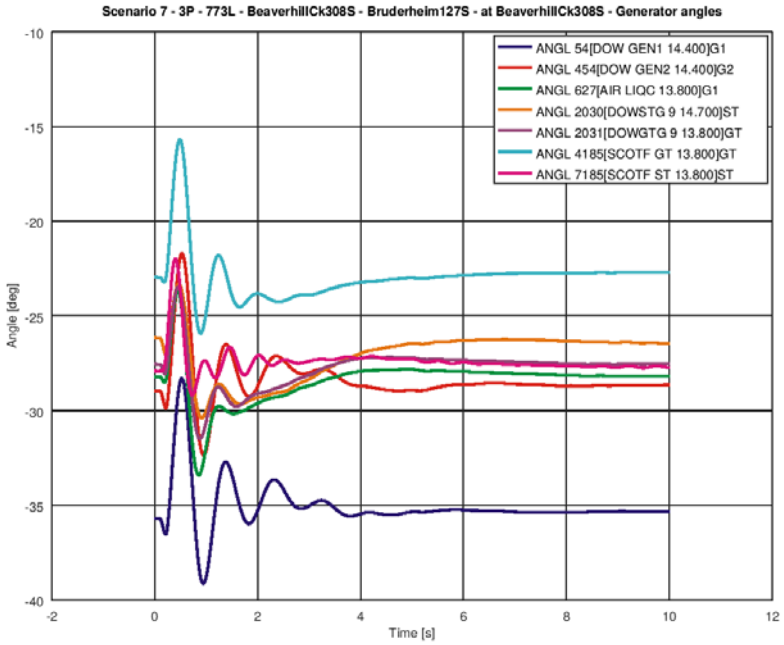


Figure A-821 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

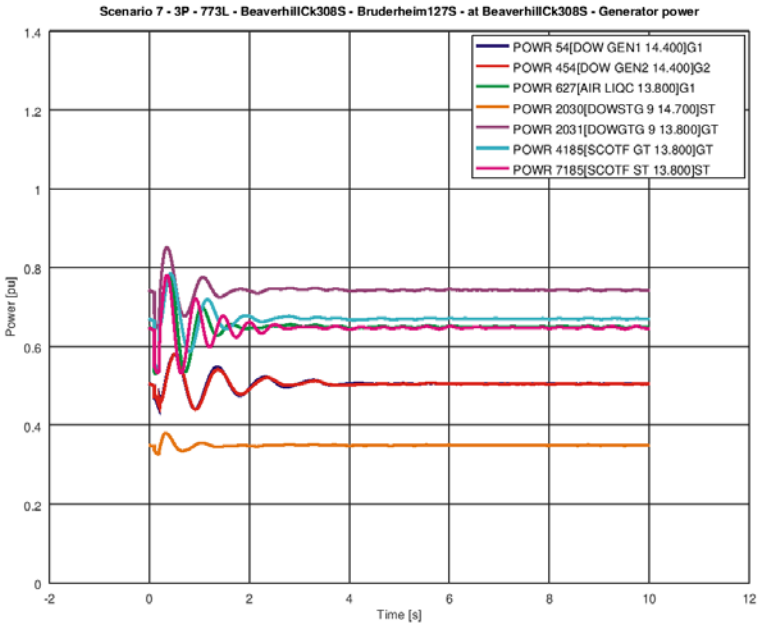


Figure A-822 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

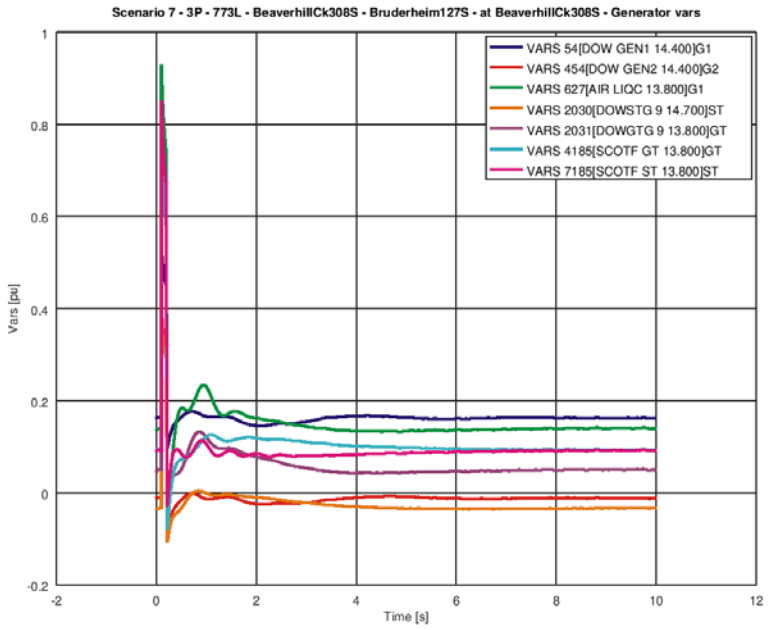


Figure A-823 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

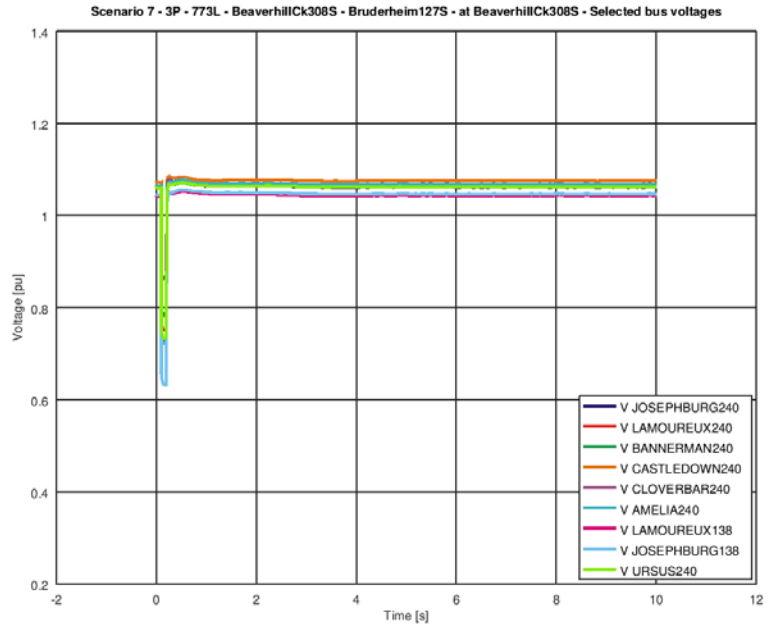


Figure A-824 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

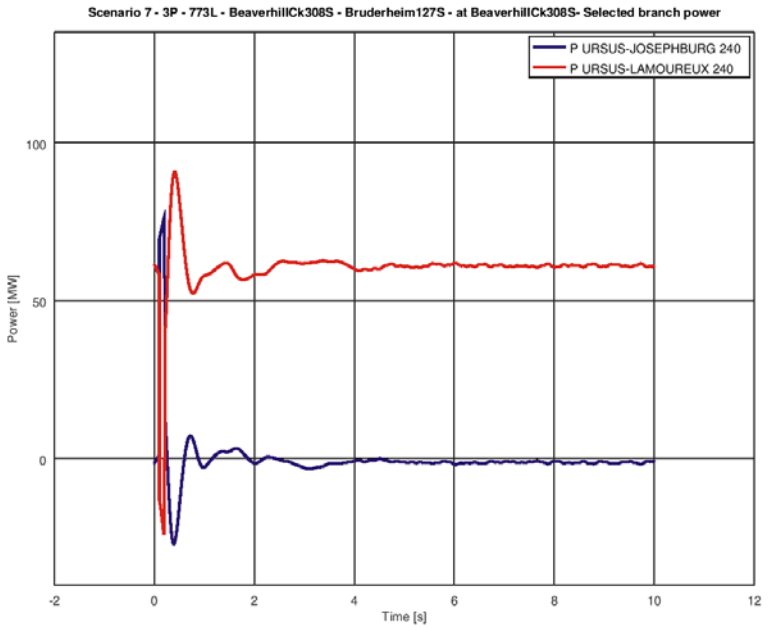


Figure A-825 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

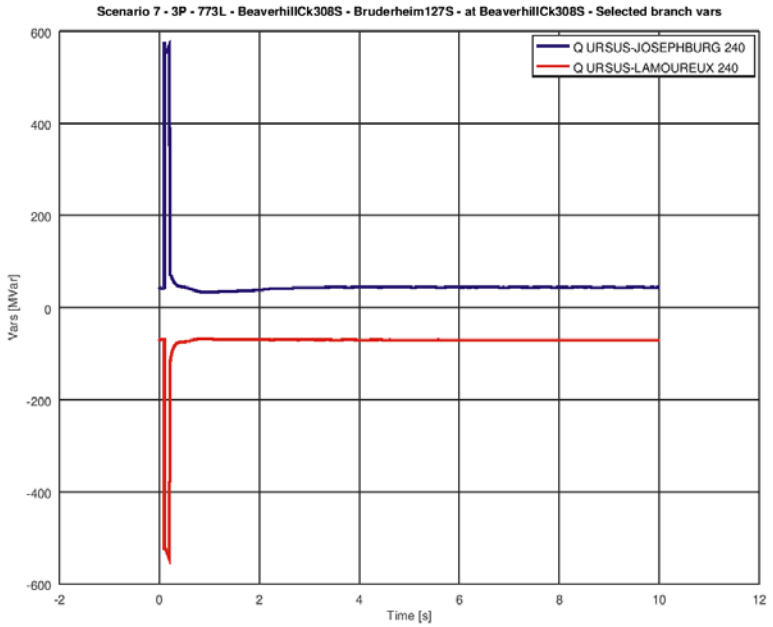


Figure A-826 Scenario 7 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

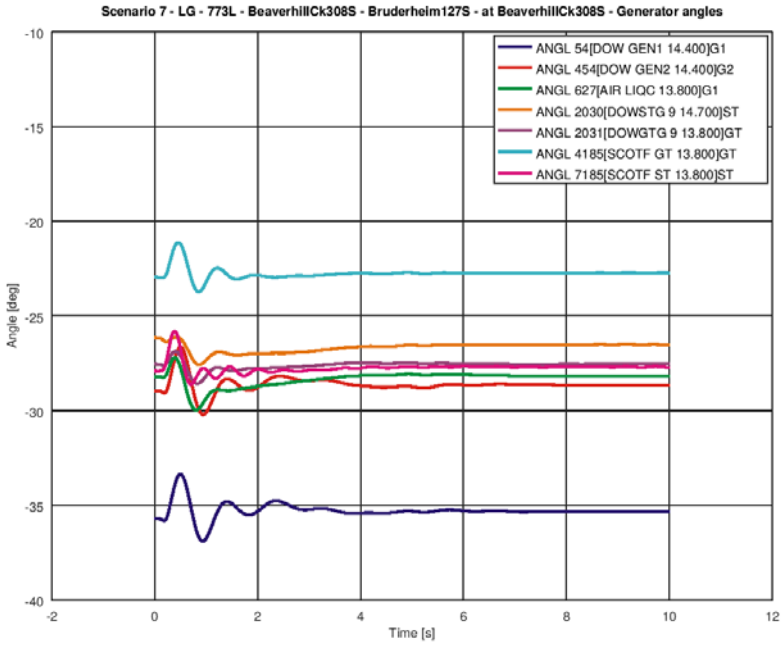


Figure A-827 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

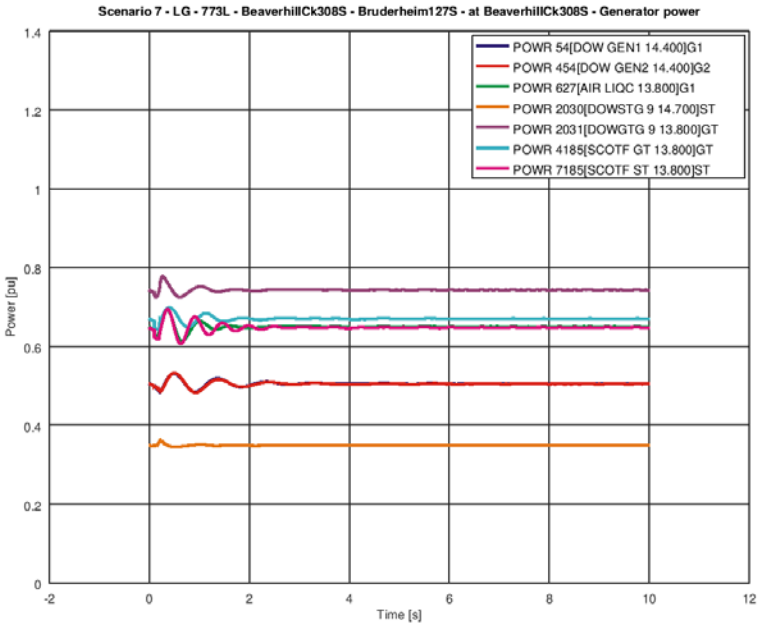


Figure A-828 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

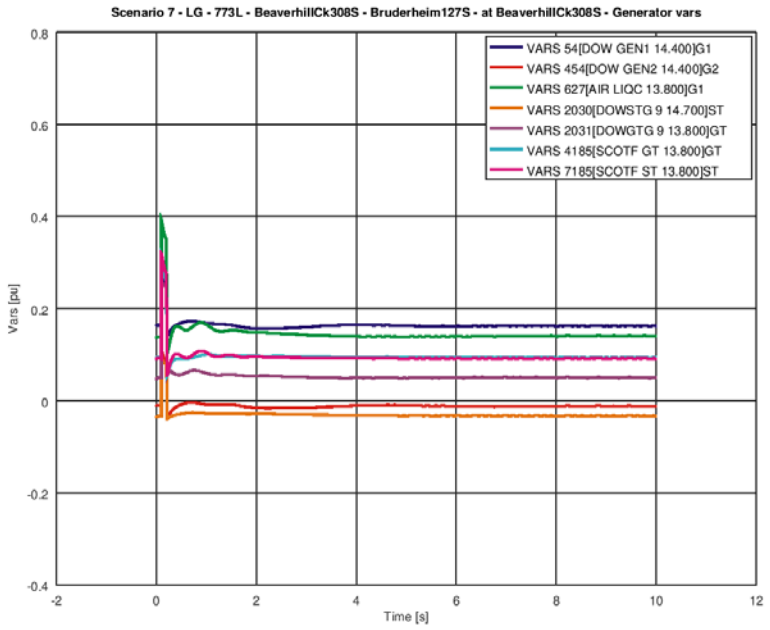


Figure A-829 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

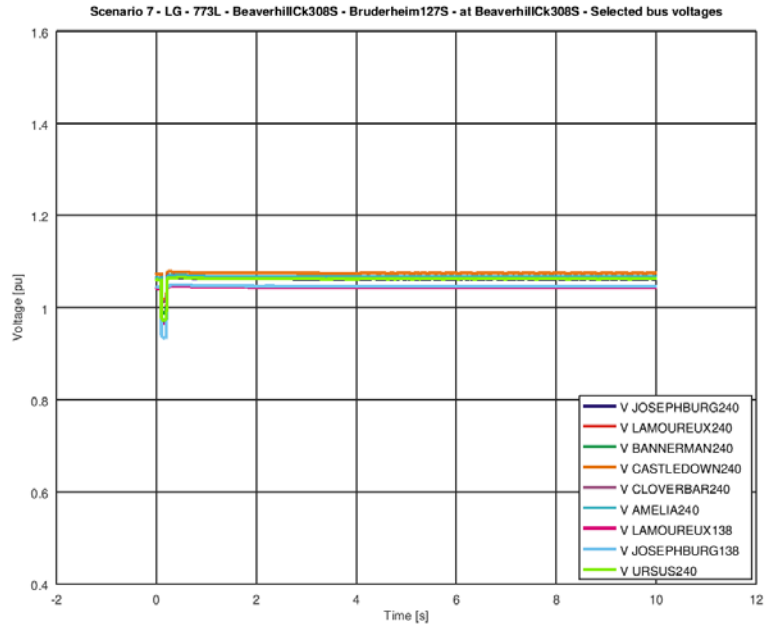


Figure A-830 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

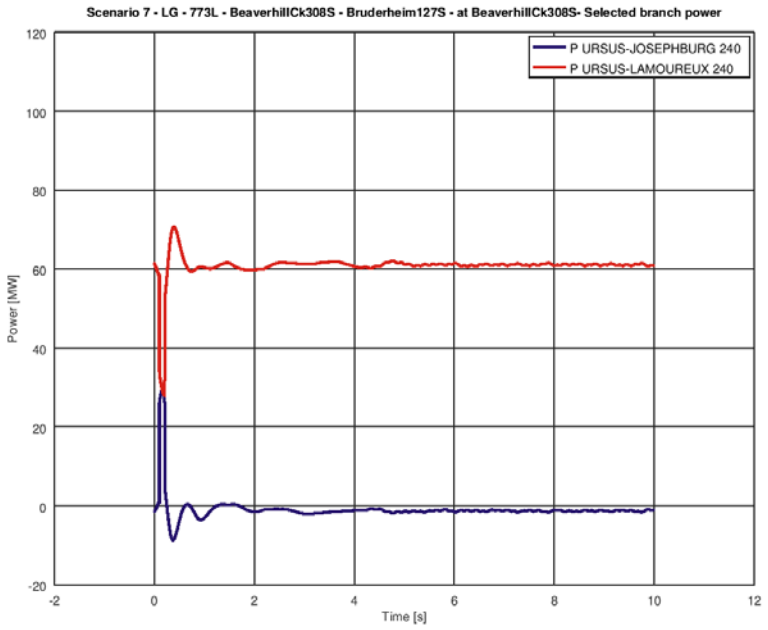


Figure A-831 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

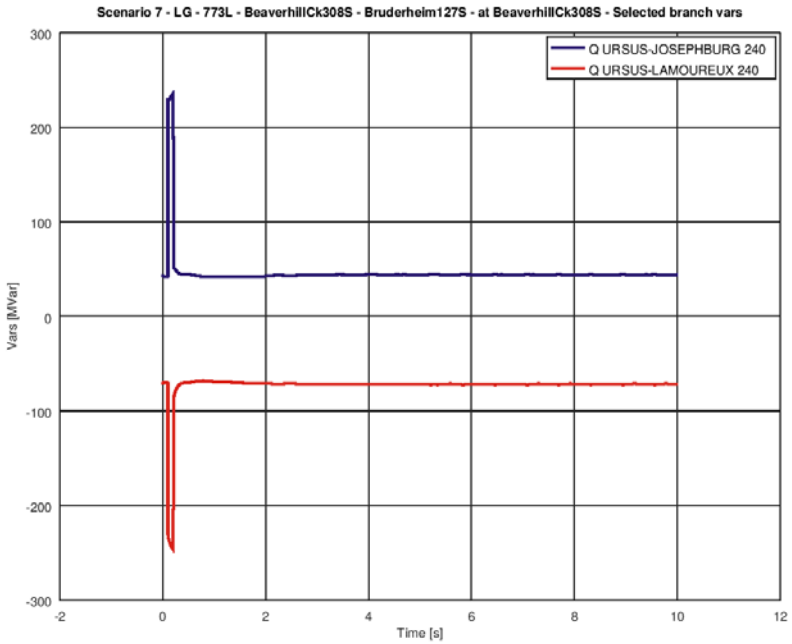


Figure A-832 Scenario 7 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

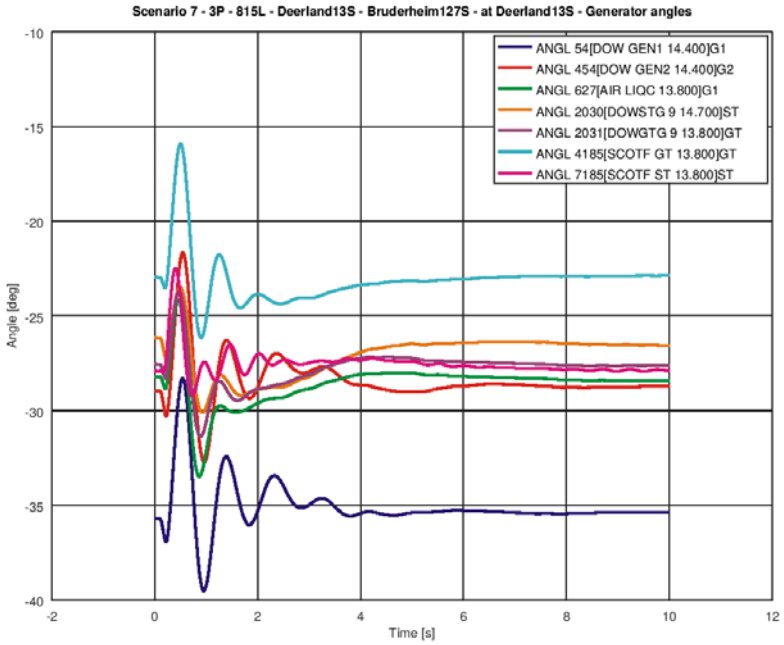


Figure A-833 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

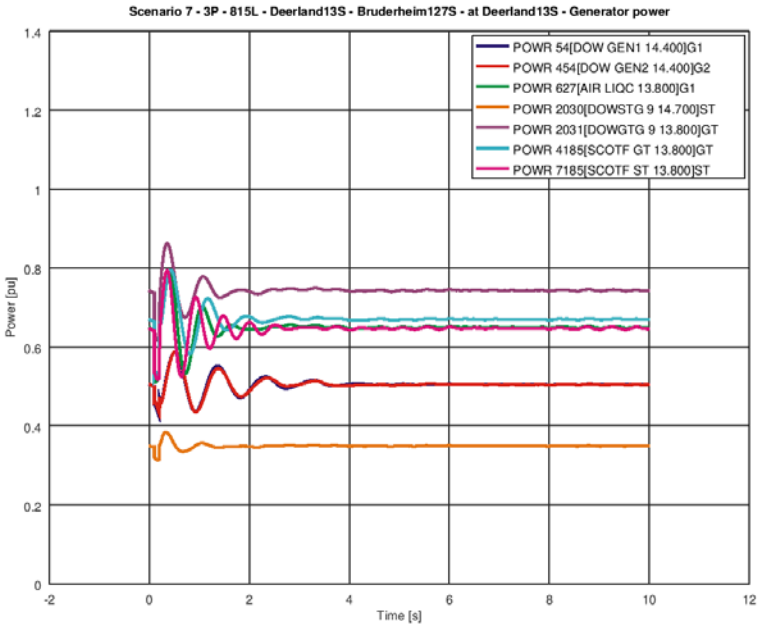


Figure A-834 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

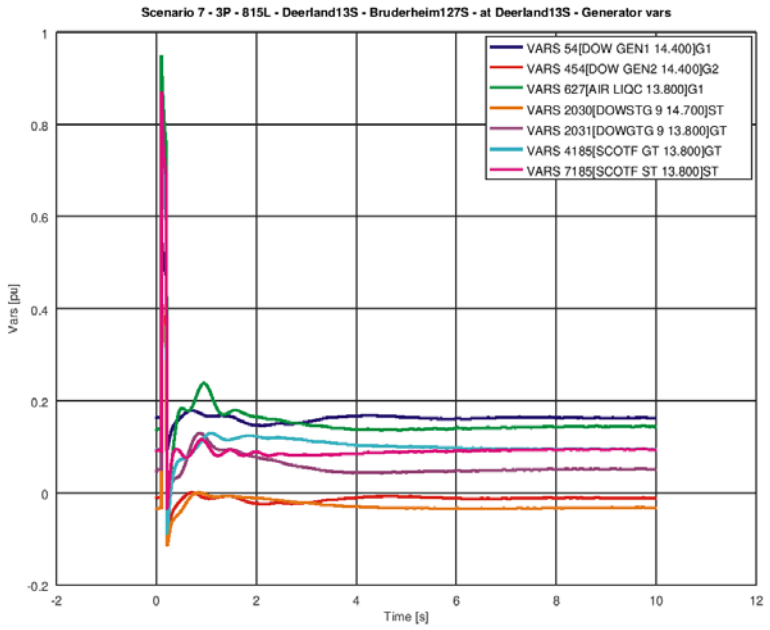


Figure A-835 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

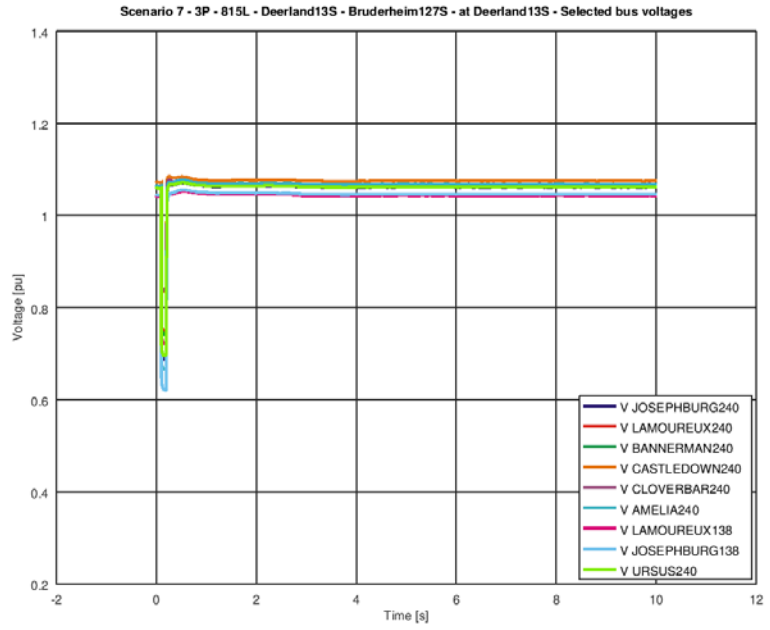


Figure A-836 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

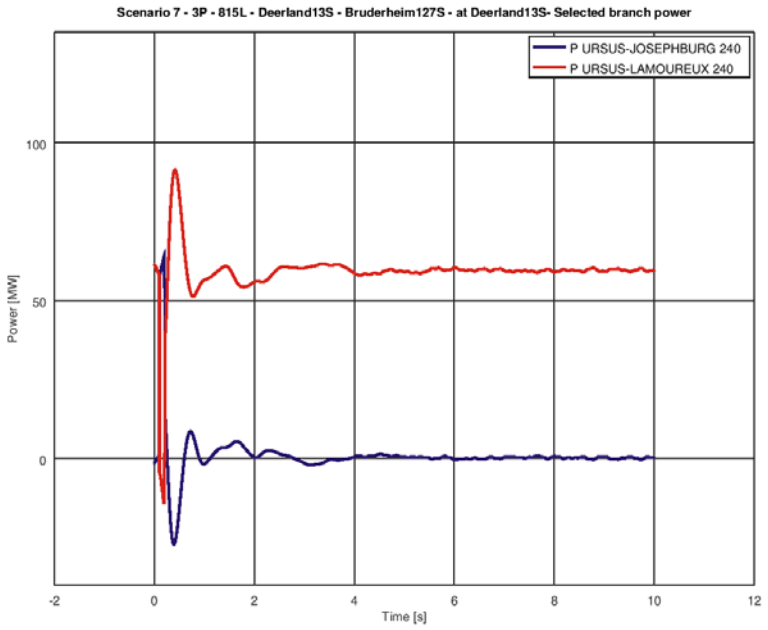


Figure A-837 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

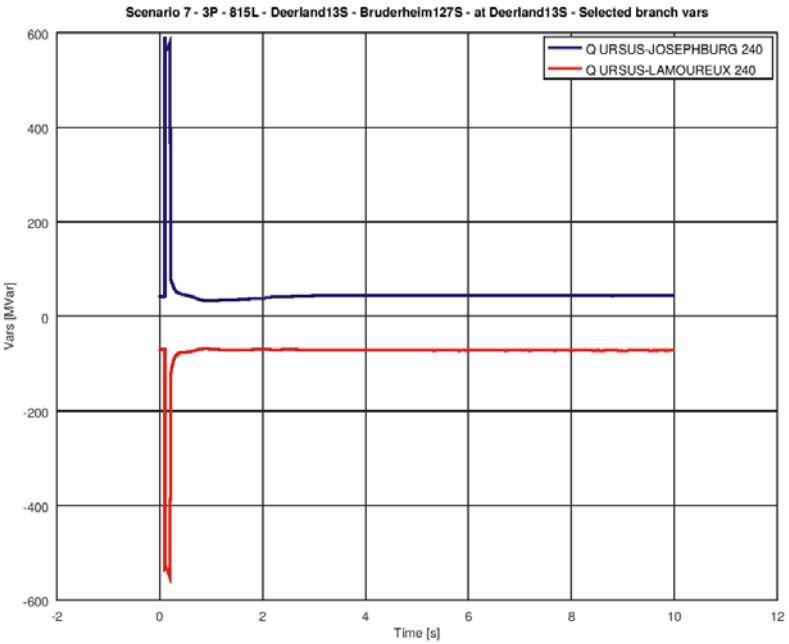


Figure A-838 Scenario 7 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

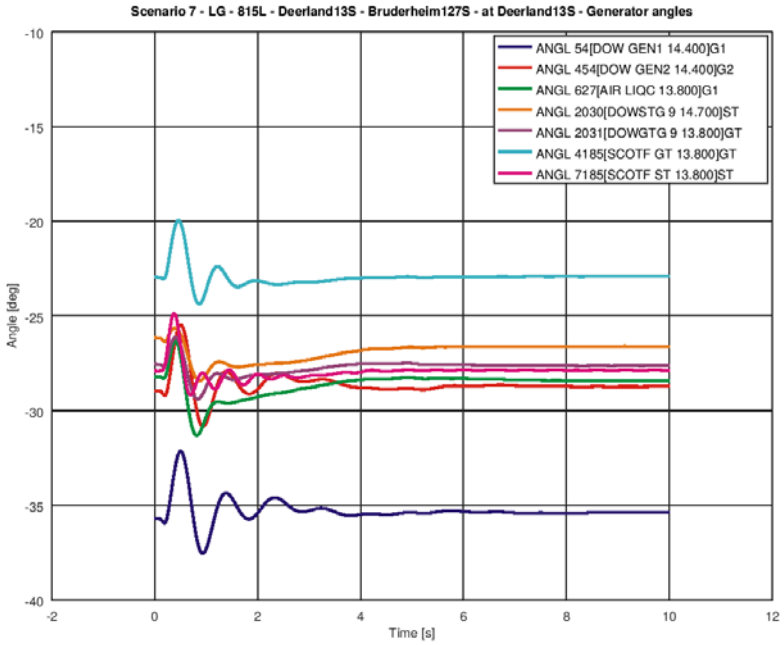


Figure A-839 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

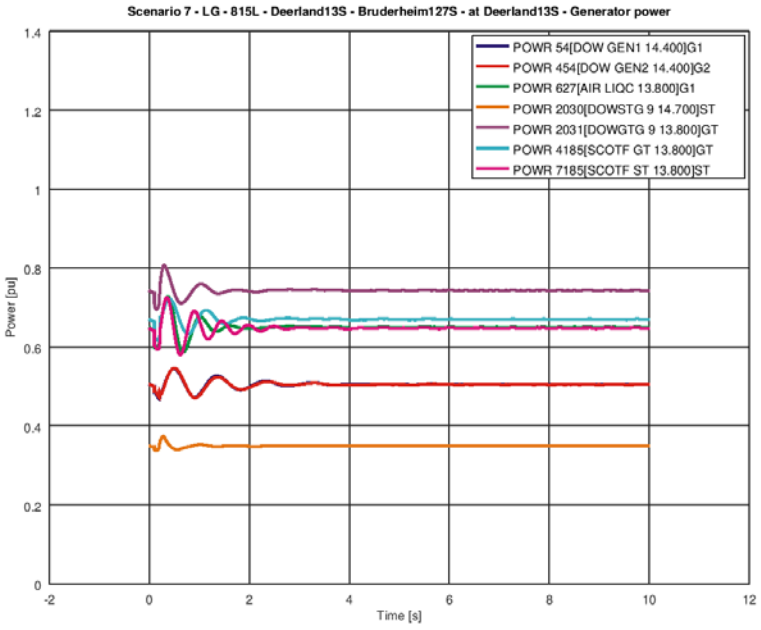


Figure A-840 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

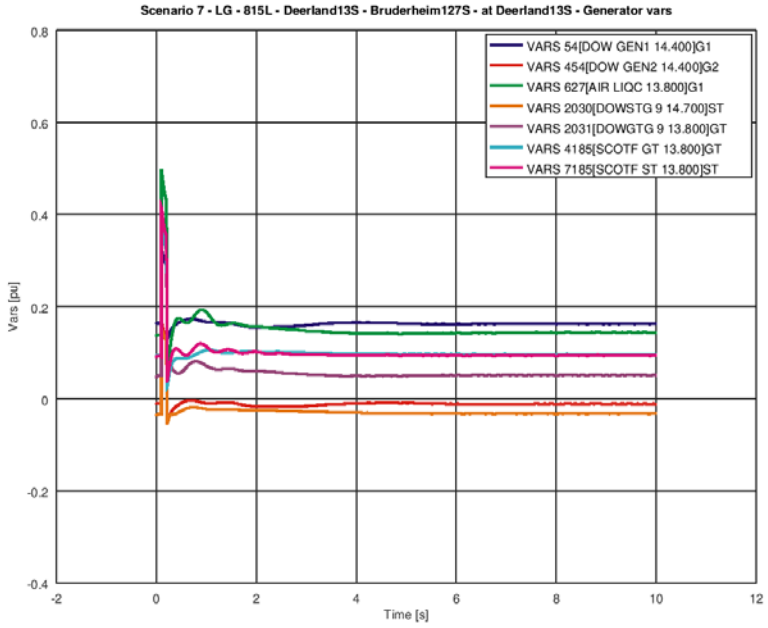


Figure A-841 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

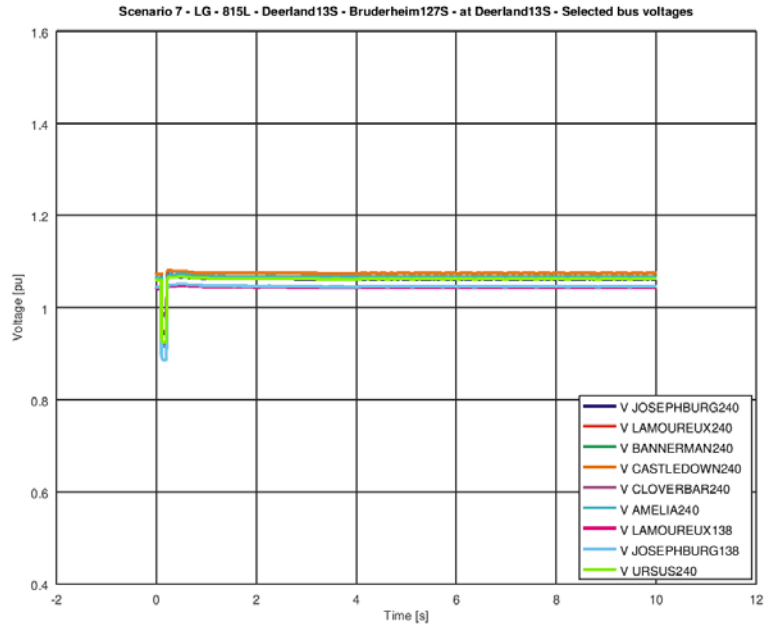


Figure A-842 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

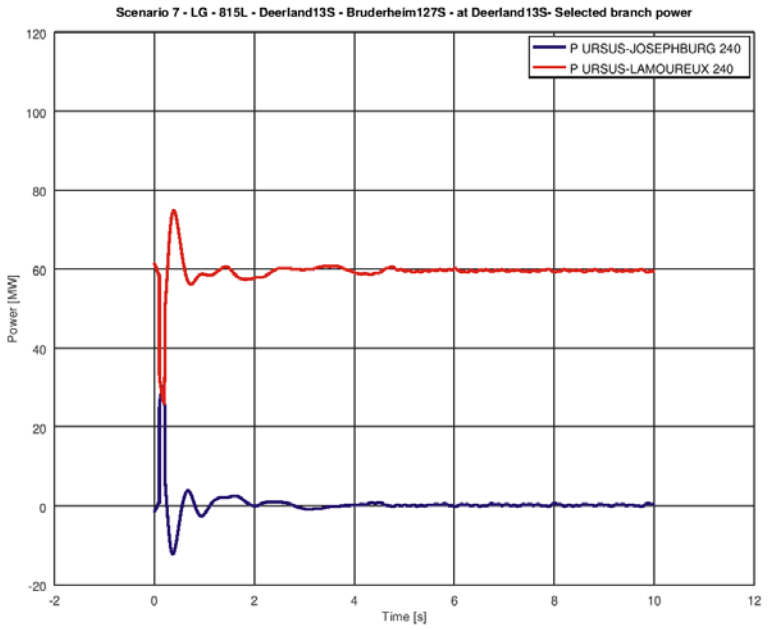


Figure A-843 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

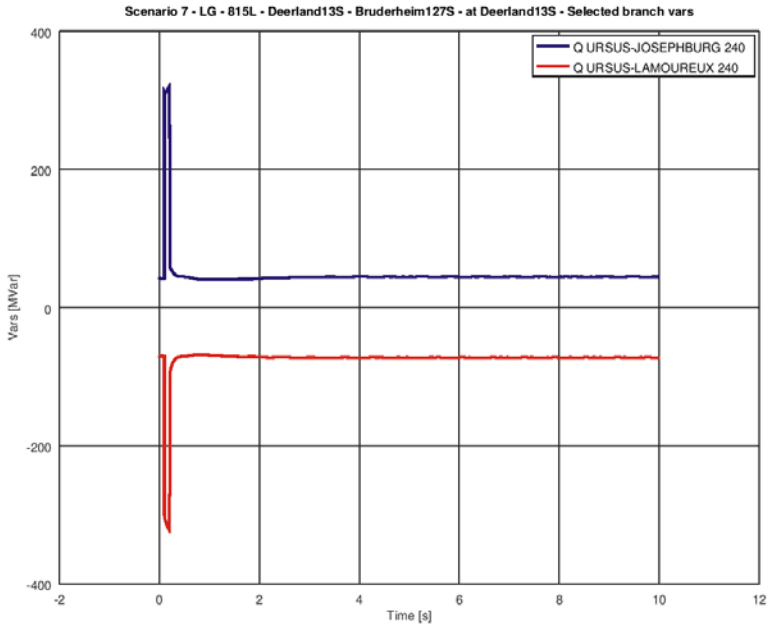


Figure A-844 Scenario 7 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

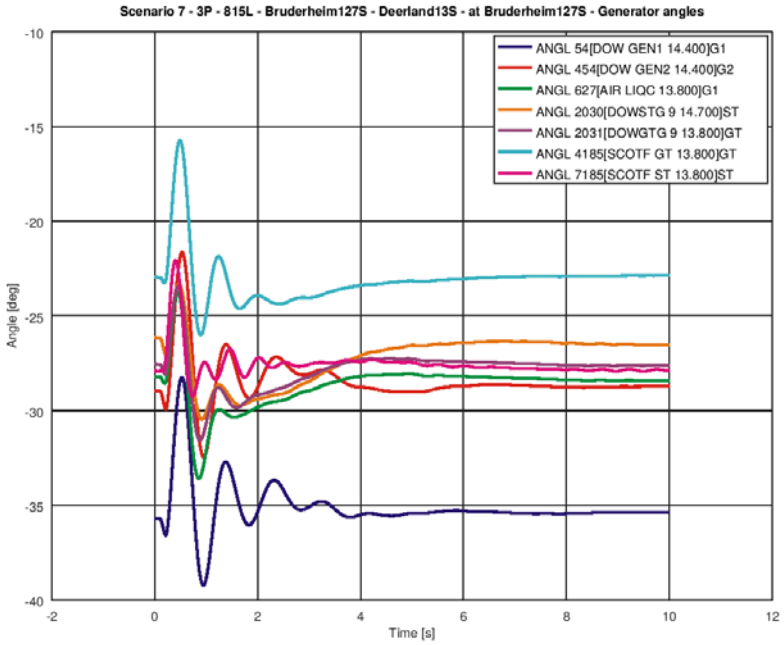


Figure A-845 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

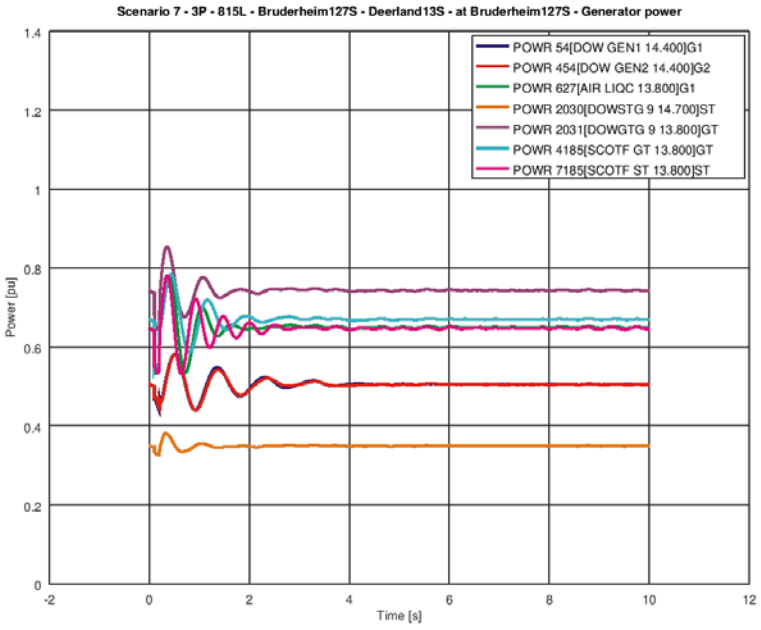


Figure A-846 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

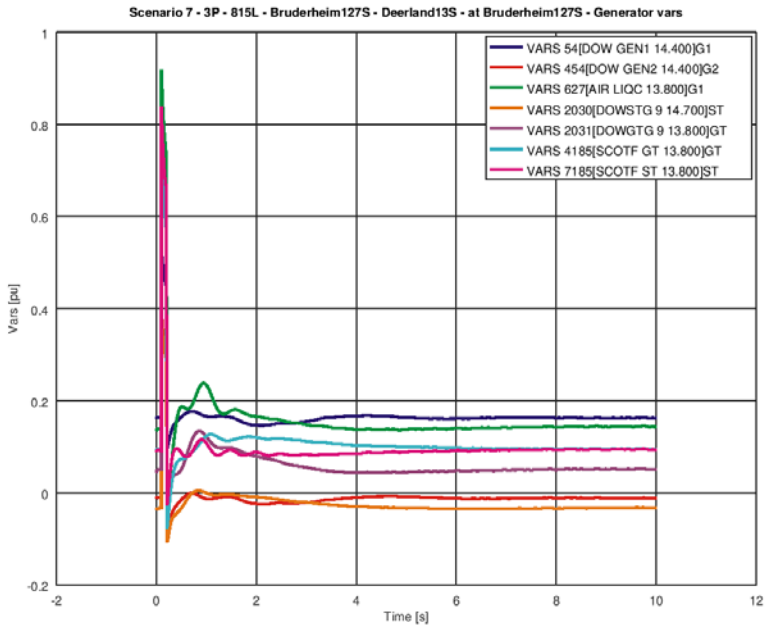


Figure A-847 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

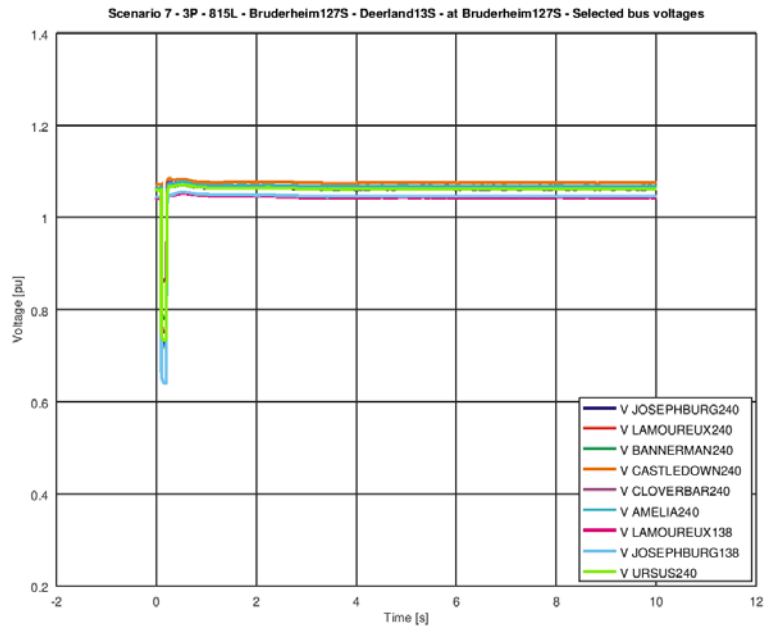


Figure A-848 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

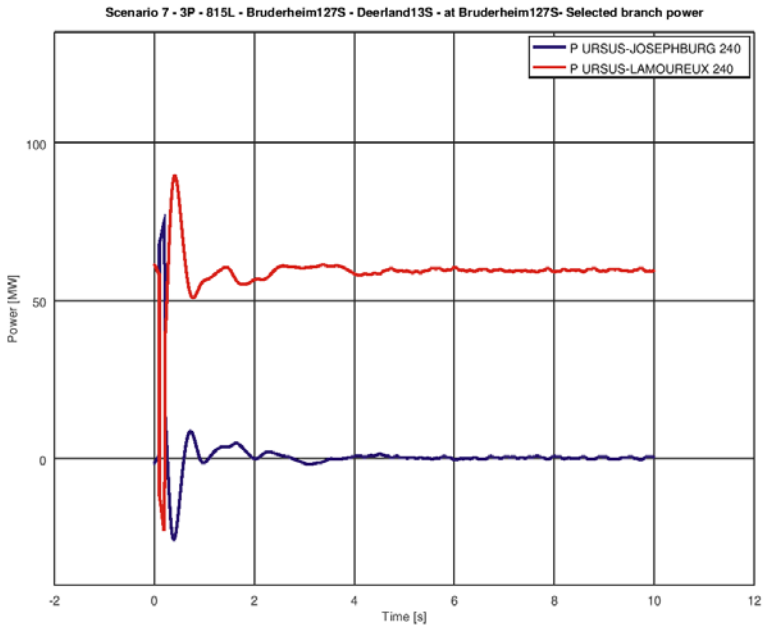


Figure A-849 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

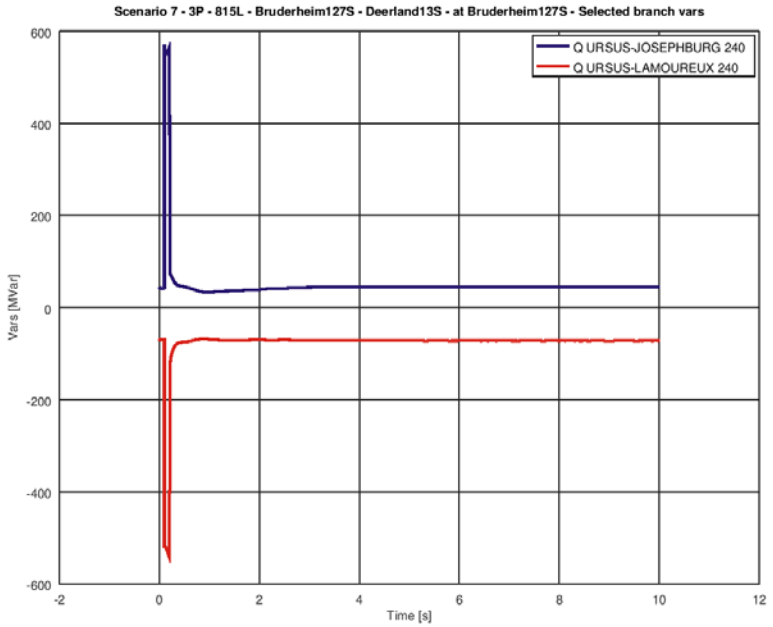


Figure A-850 Scenario 7 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

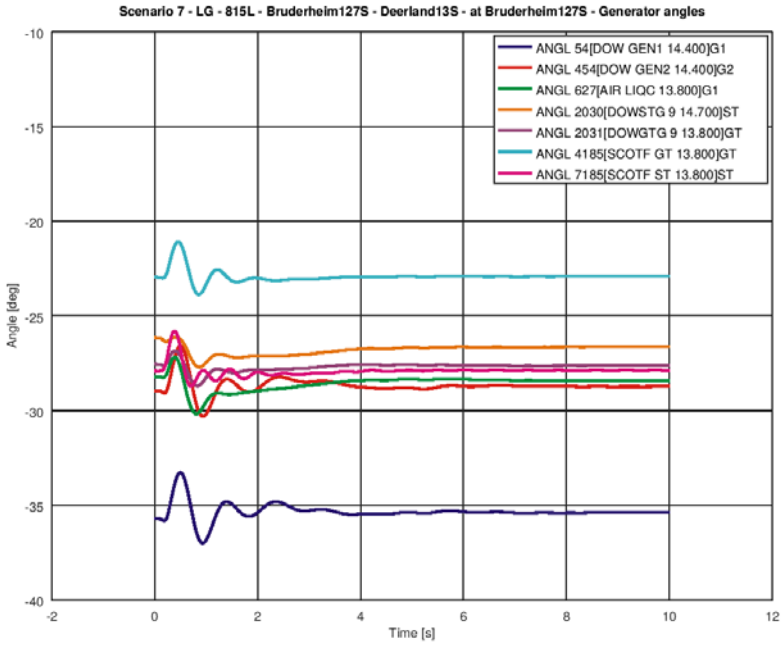


Figure A-851 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

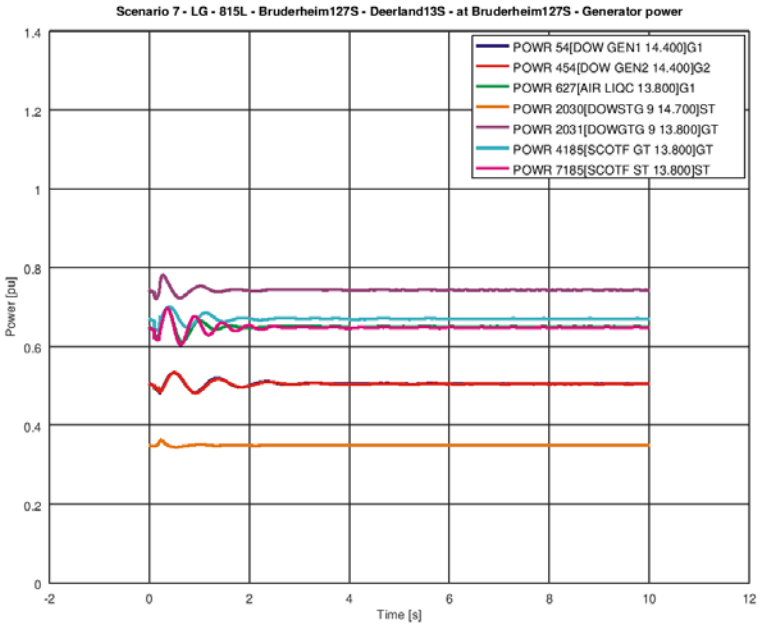


Figure A-852 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

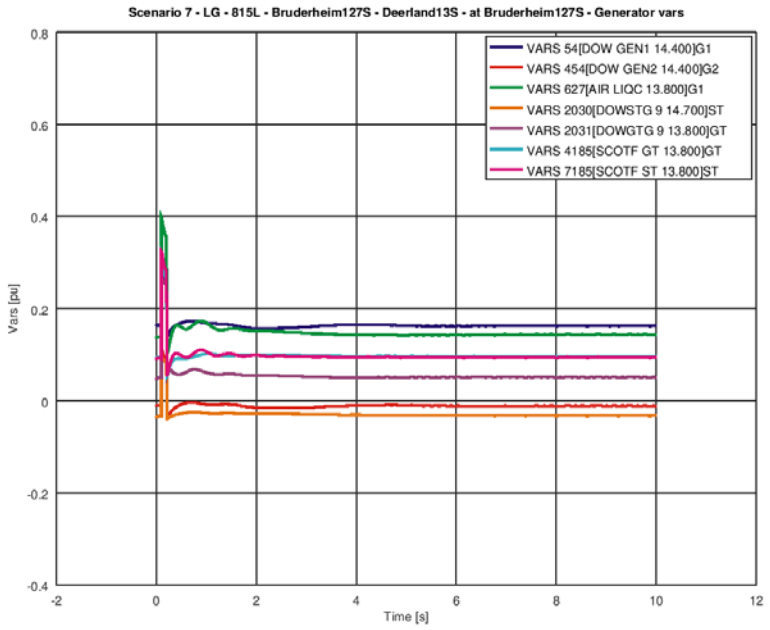


Figure A-853 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

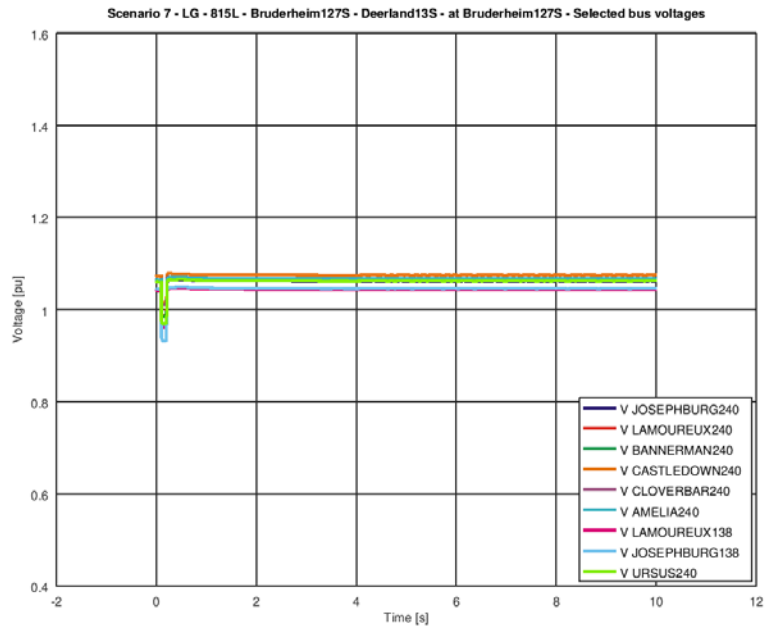


Figure A-854 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

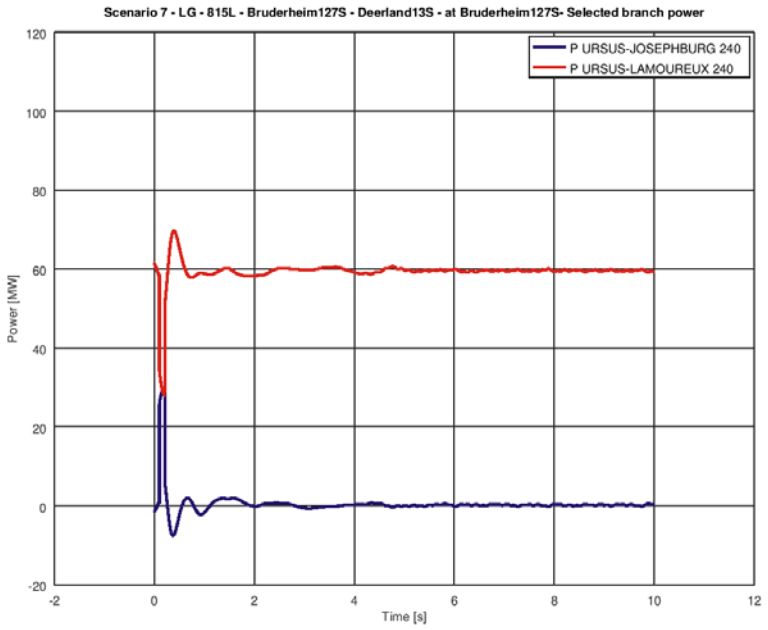


Figure A-855 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

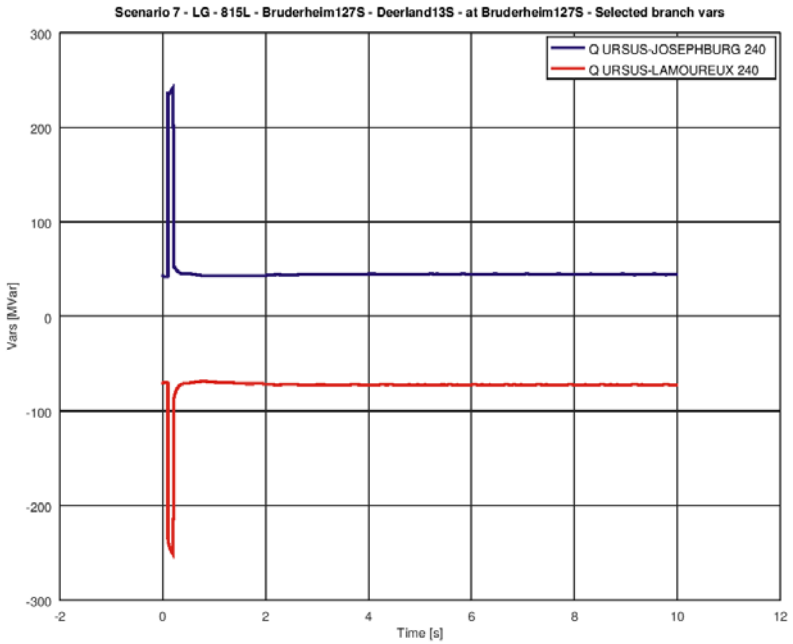


Figure A-856 Scenario 7 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

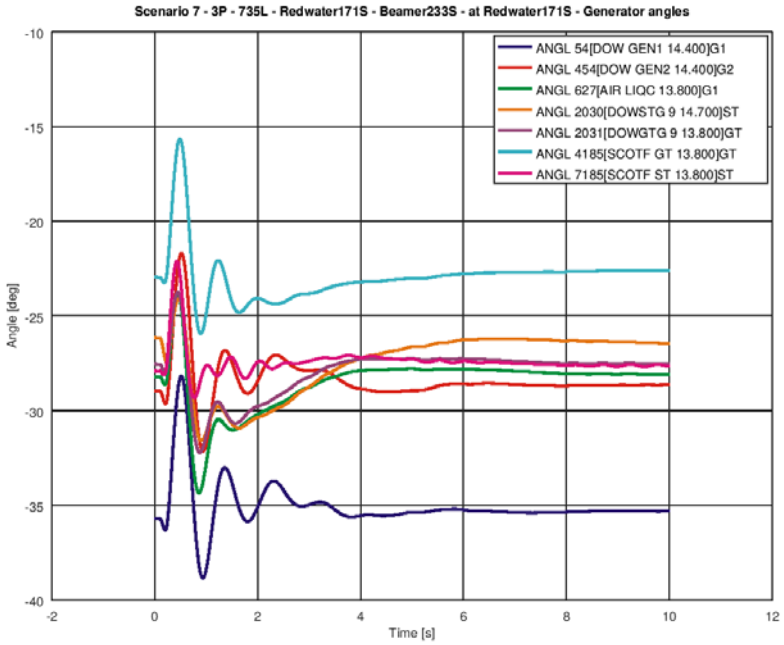


Figure A-857 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

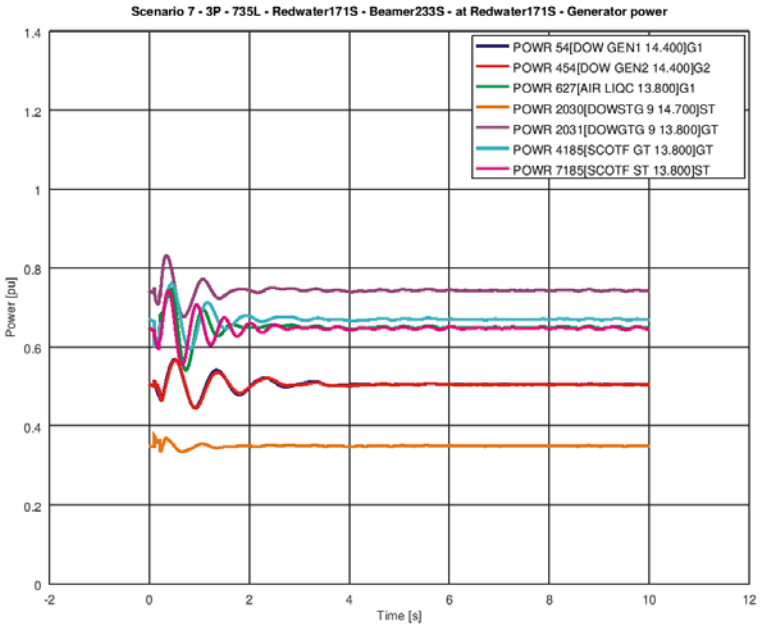


Figure A-858 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

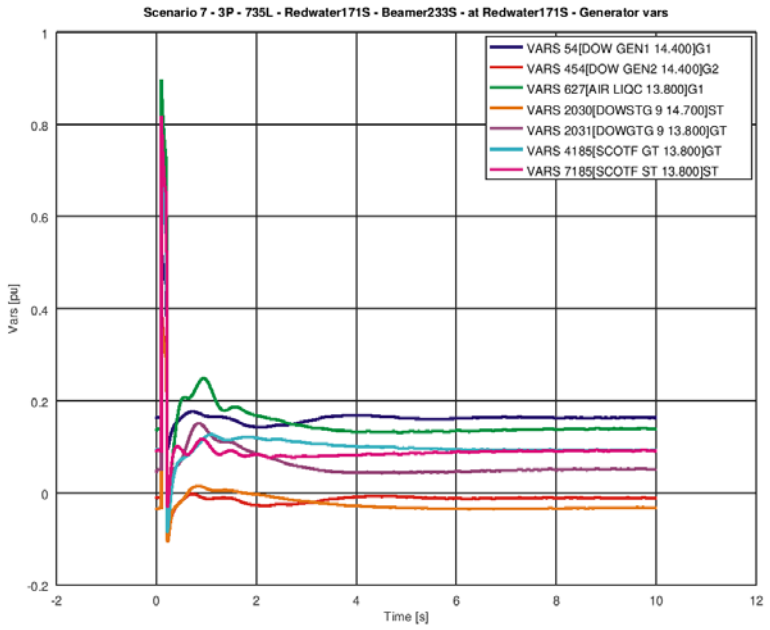


Figure A-859 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

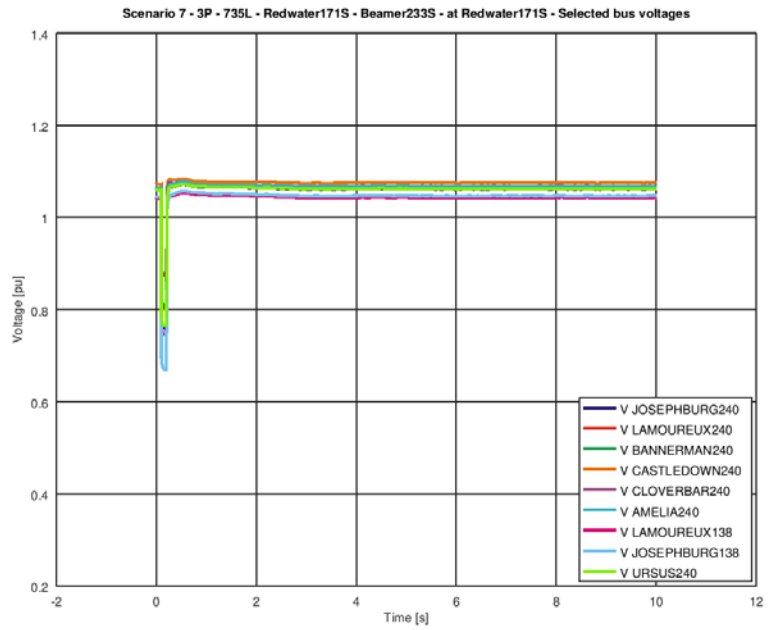


Figure A-860 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

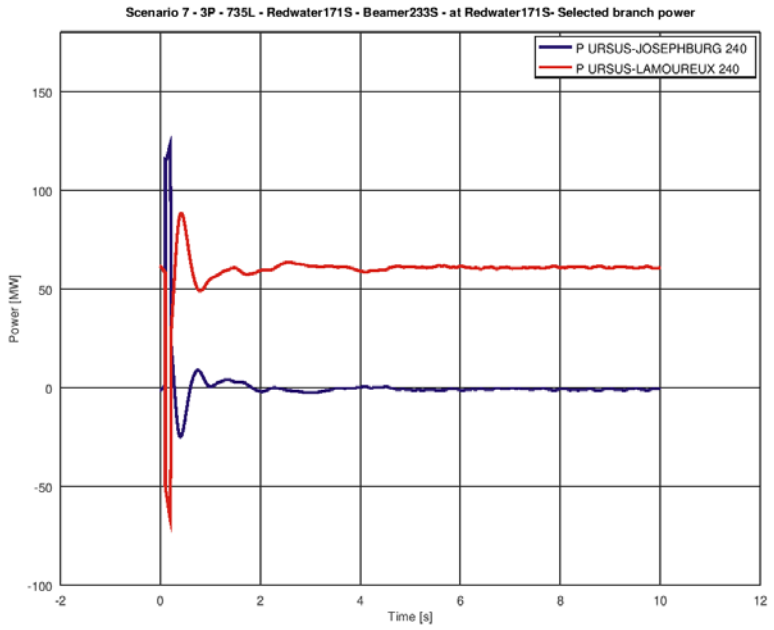


Figure A-861 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

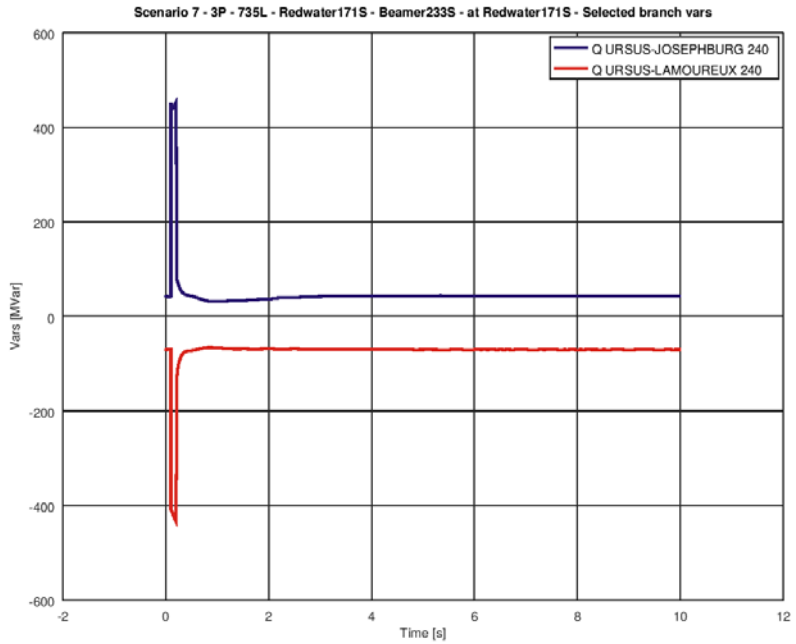


Figure A-862 Scenario 7 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

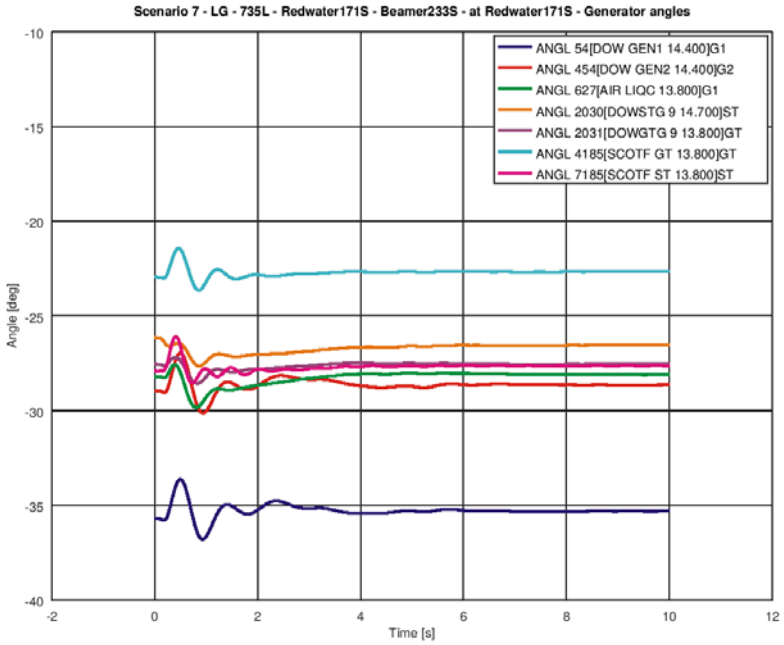


Figure A-863 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

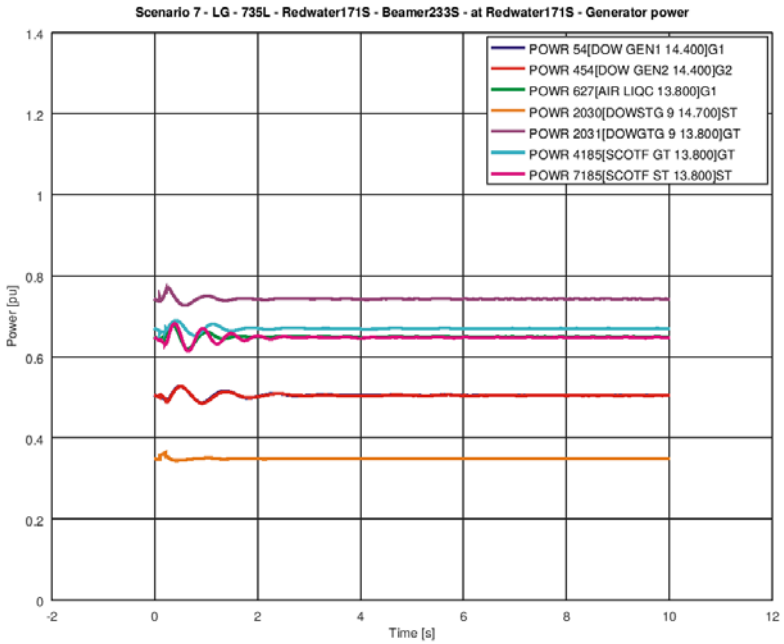


Figure A-864 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

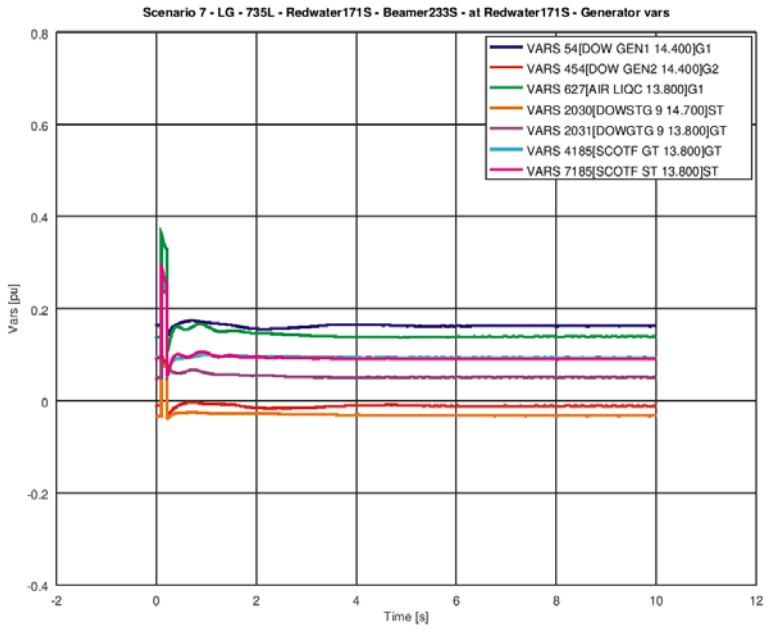


Figure A-865 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

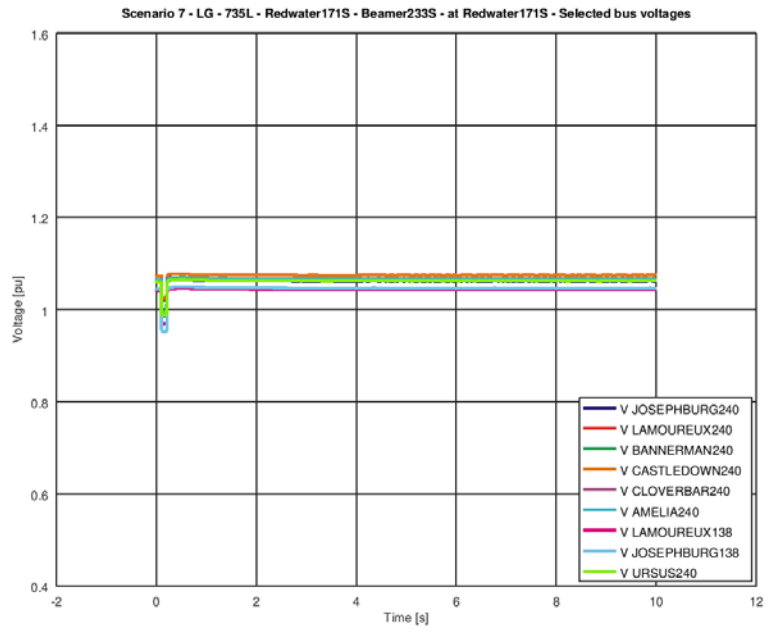


Figure A-866 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

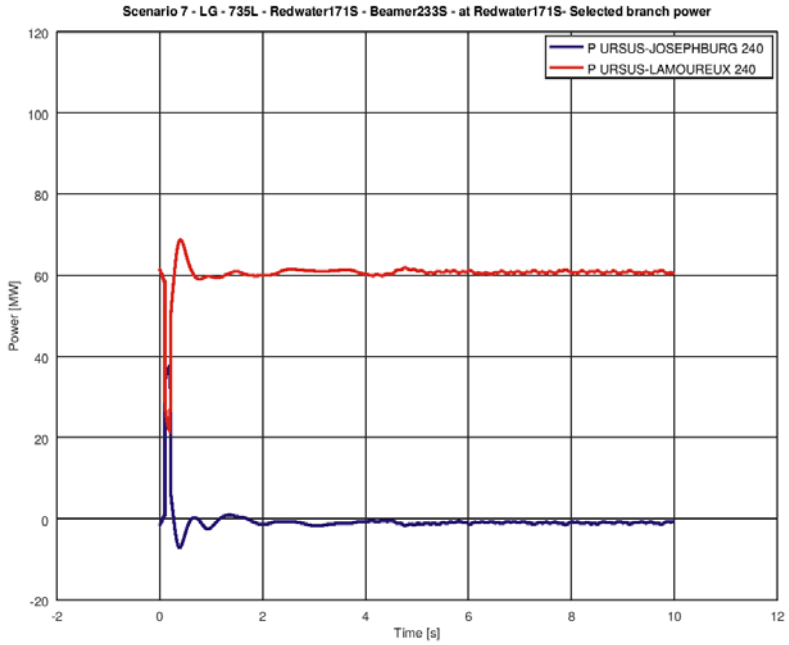


Figure A-867 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

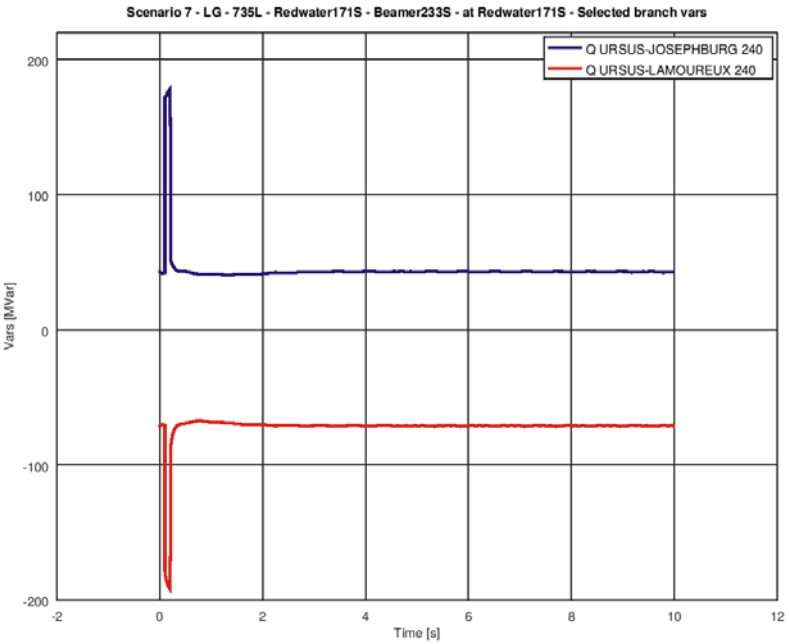


Figure A-868 Scenario 7 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

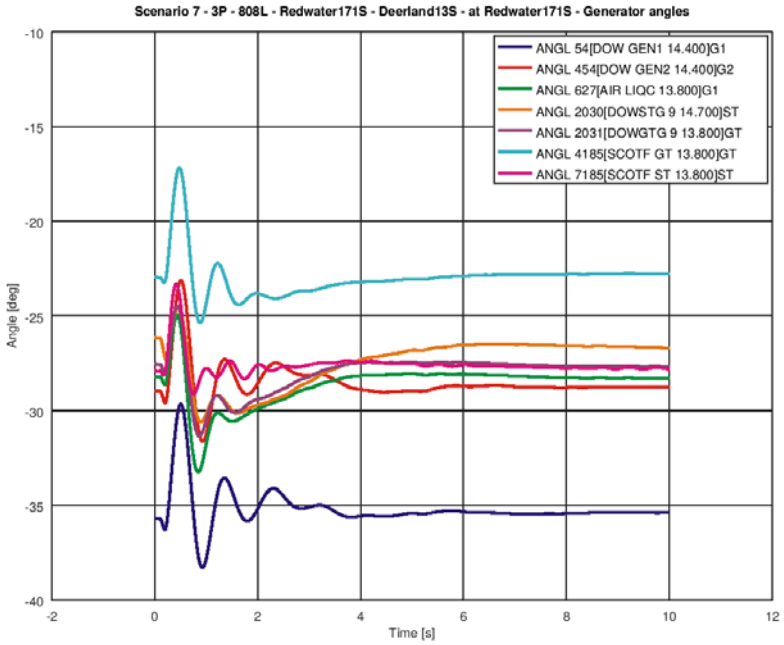


Figure A-869 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

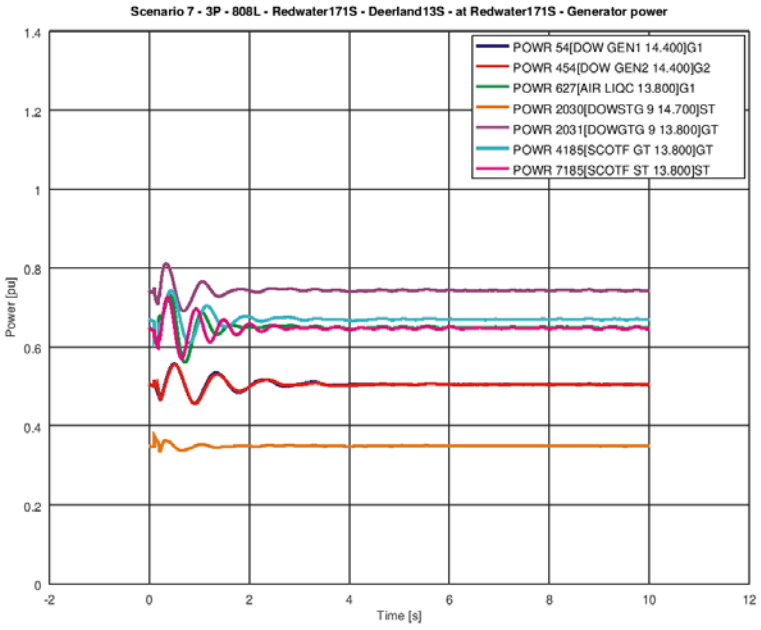


Figure A-870 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

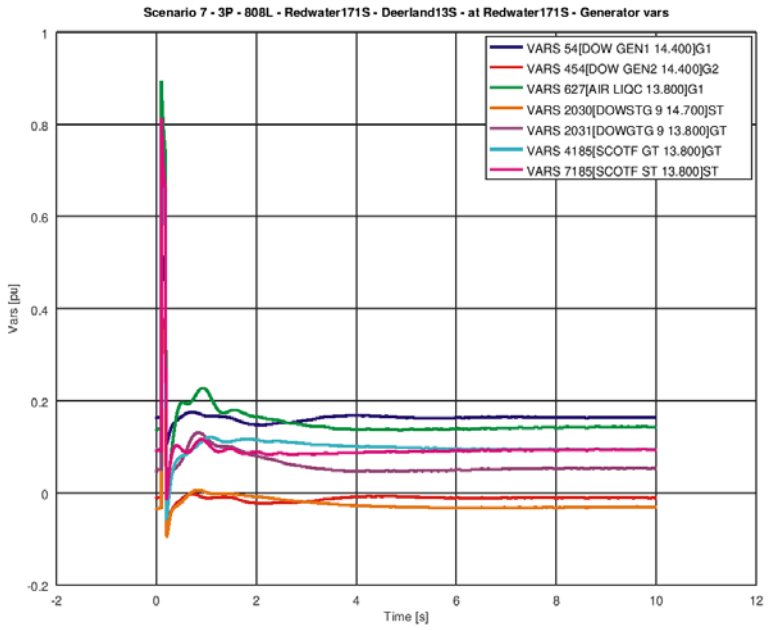


Figure A-871 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

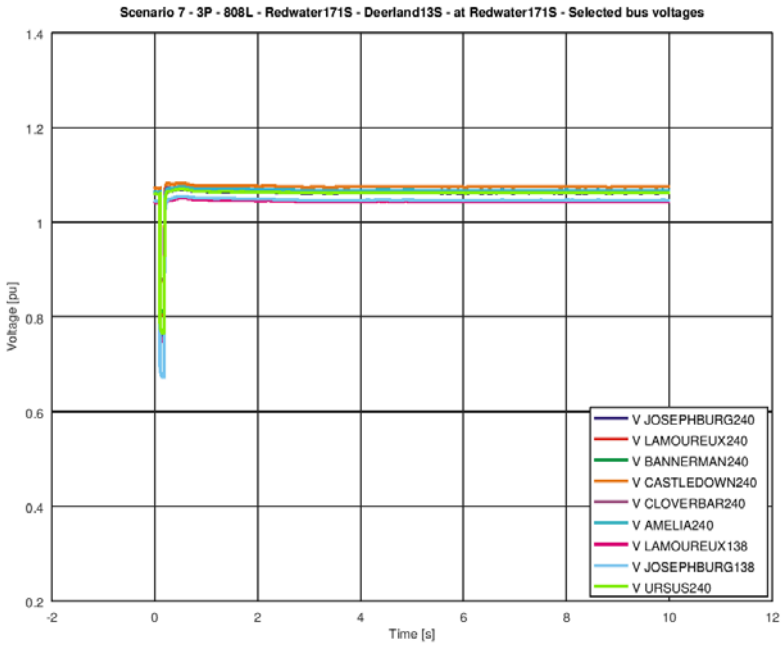


Figure A-872 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

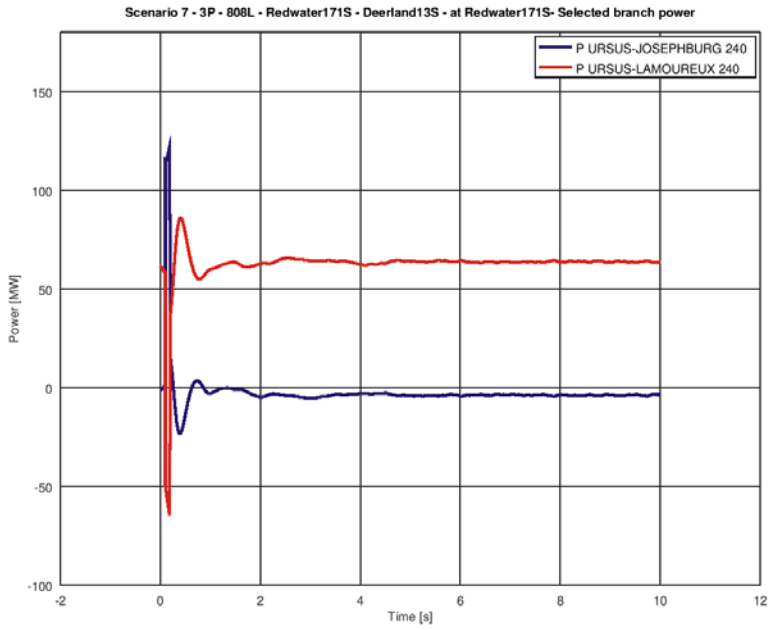


Figure A-873 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

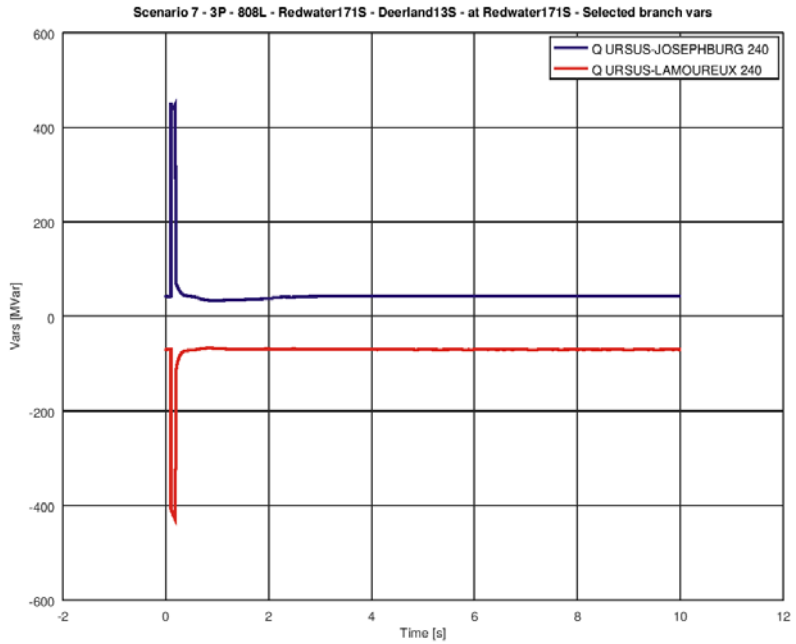


Figure A-874 Scenario 7 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

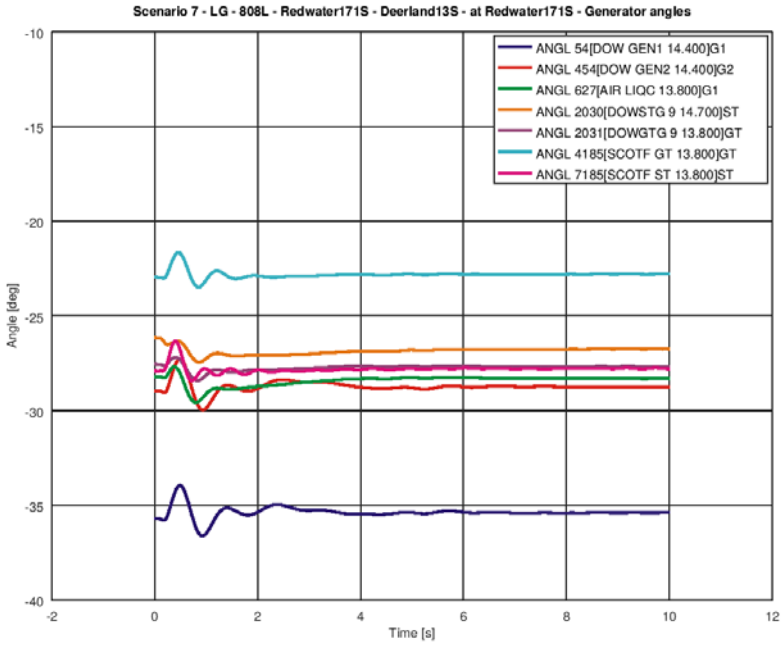


Figure A-875 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

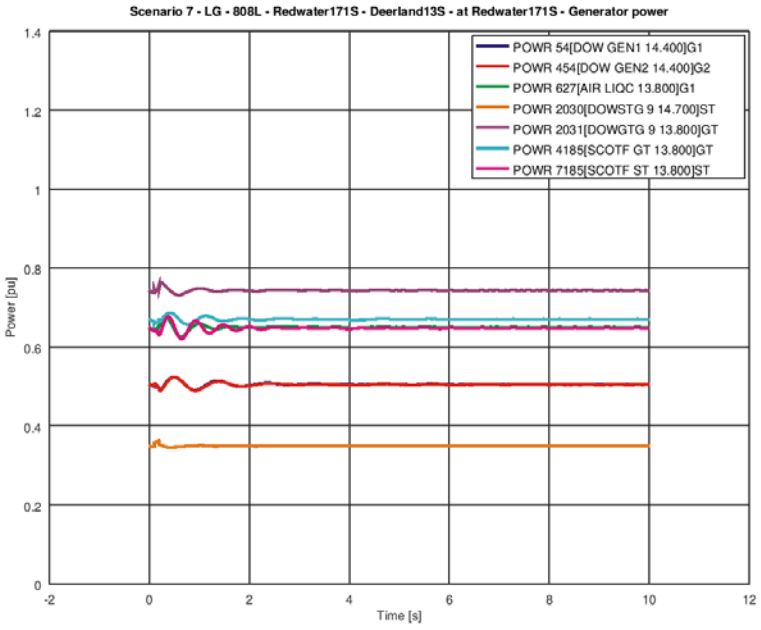


Figure A-876 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

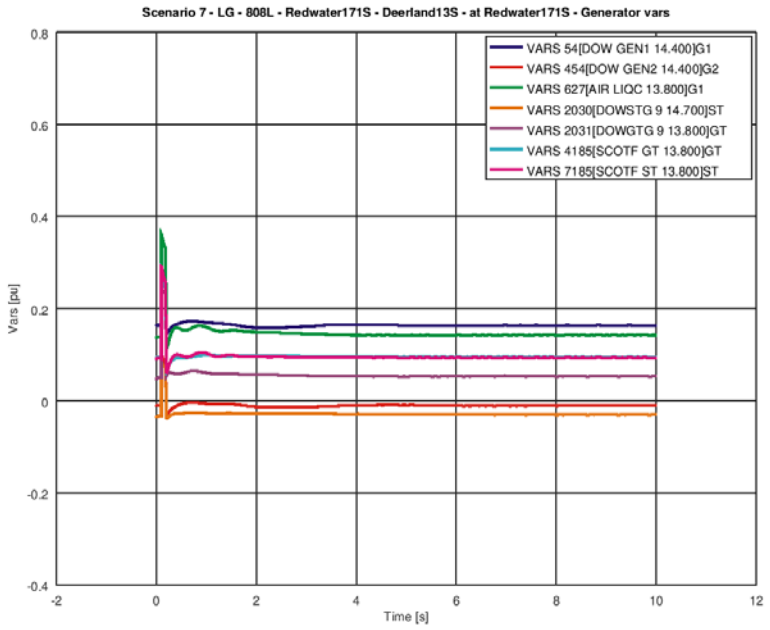


Figure A-877 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

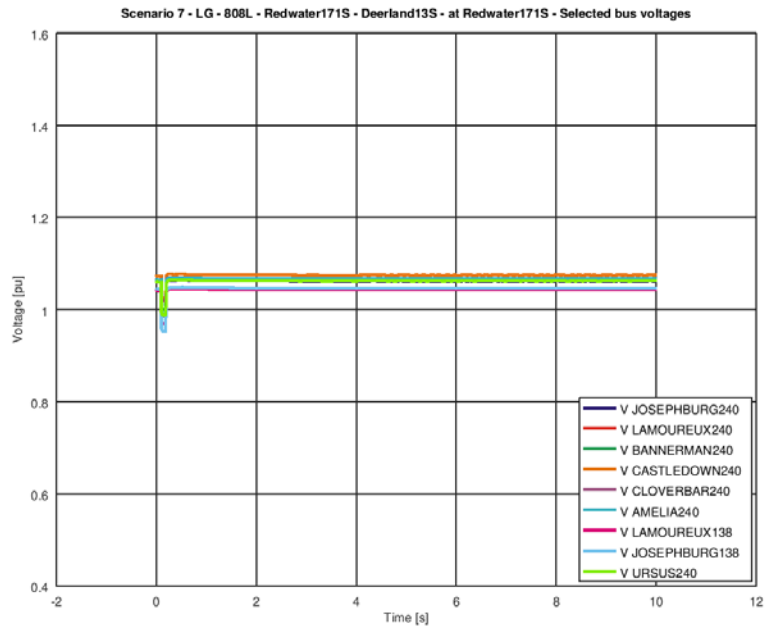


Figure A-878 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

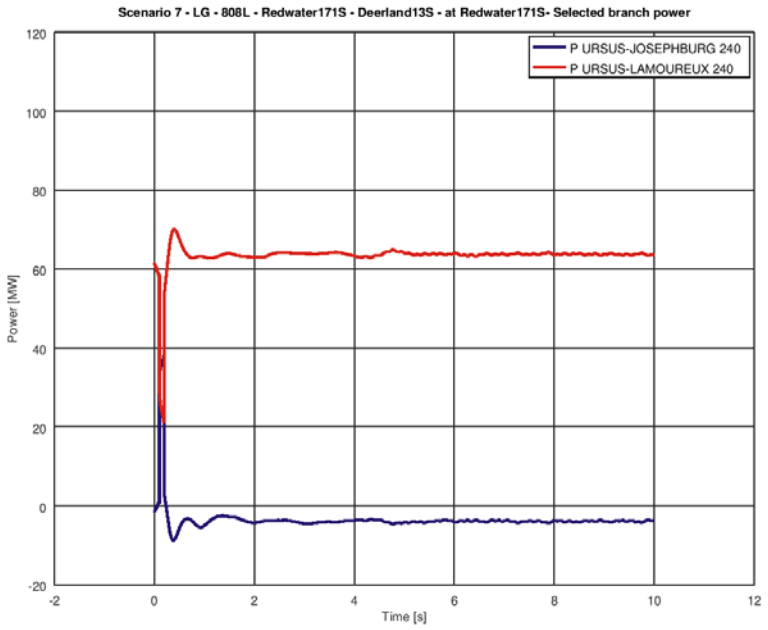


Figure A-879 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

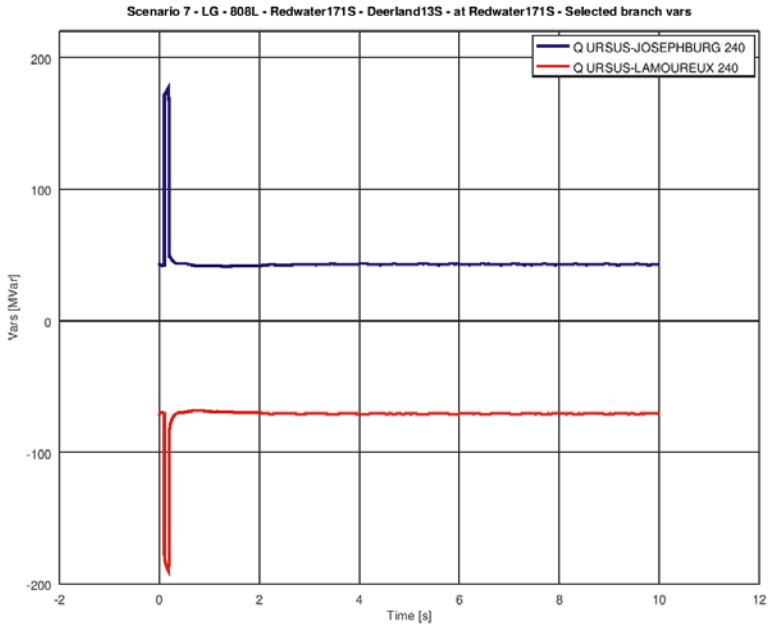


Figure A-880 Scenario 7 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

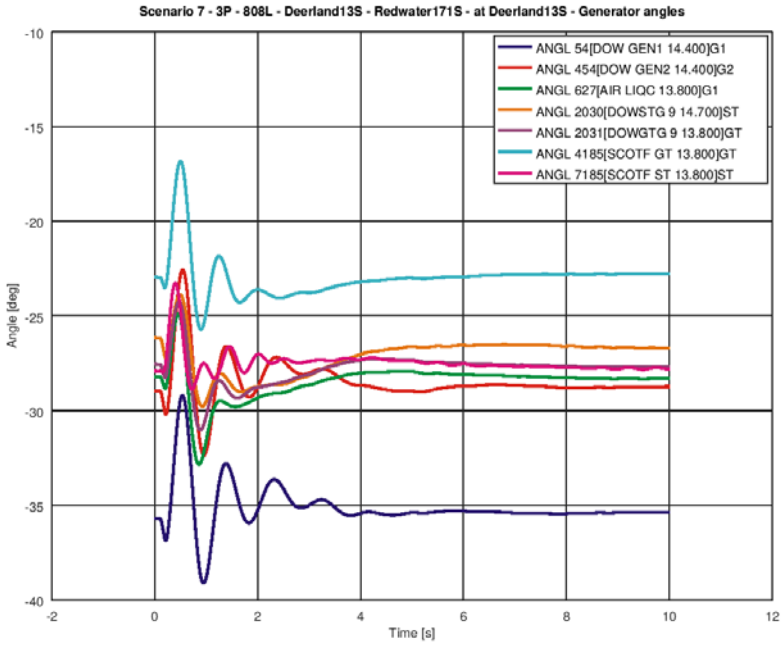


Figure A-881 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

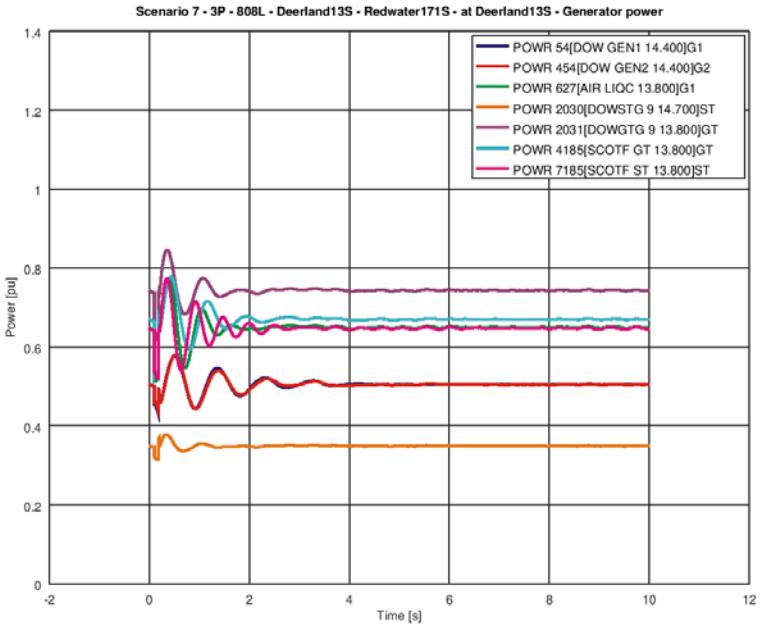


Figure A-882 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

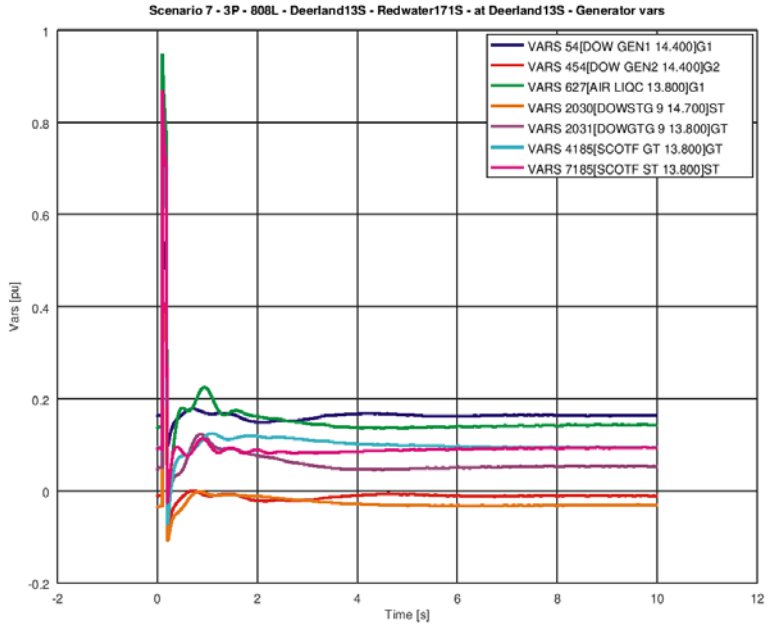


Figure A-883 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

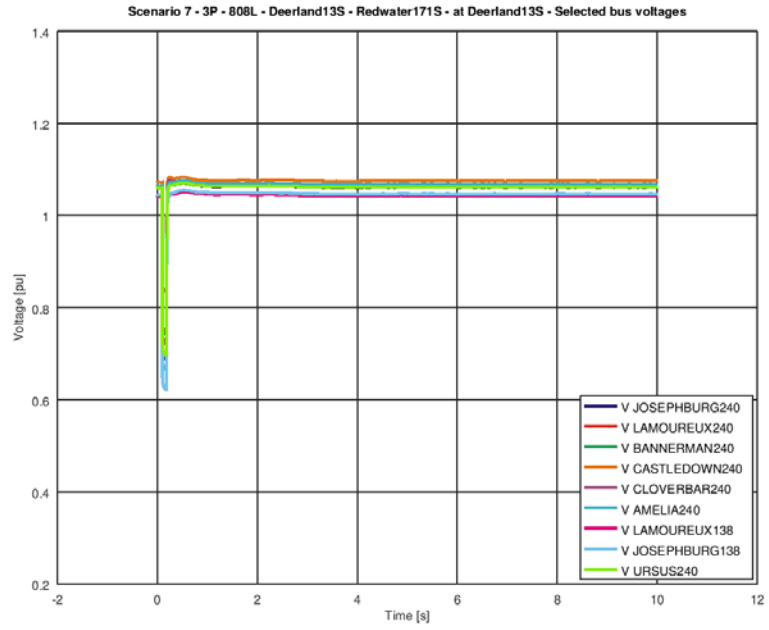


Figure A-884 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

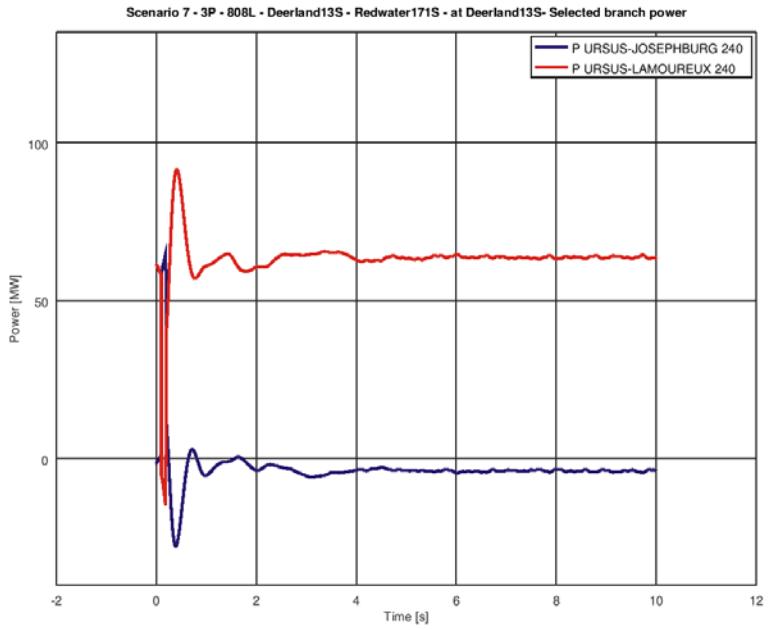


Figure A-885 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

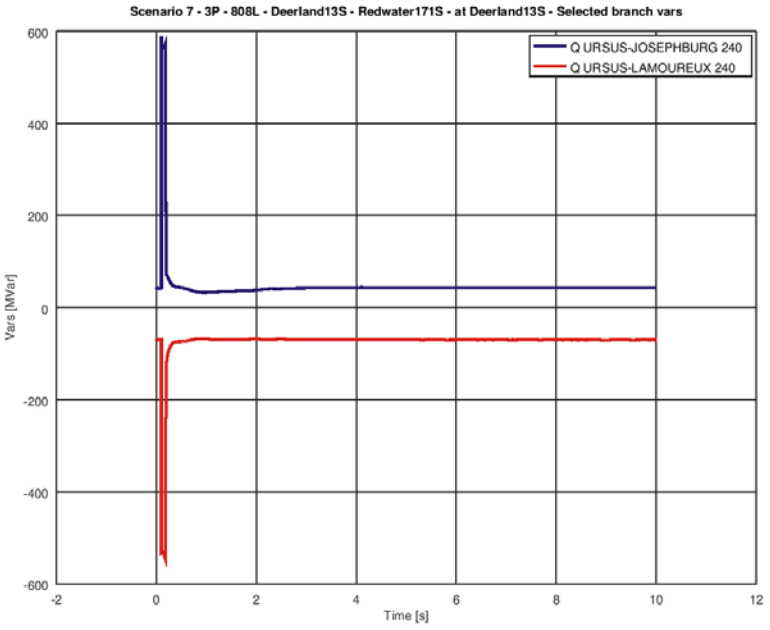


Figure A-886 Scenario 7 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

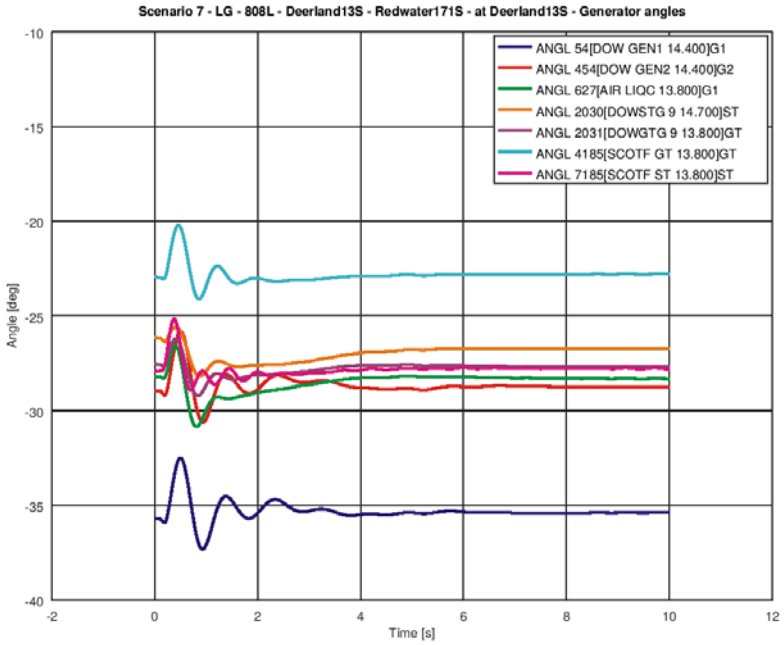


Figure A-887 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

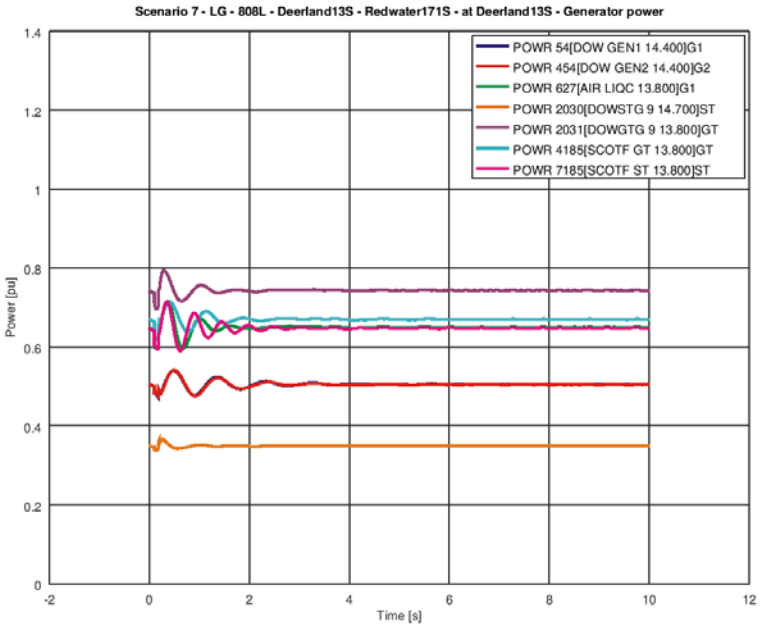


Figure A-888 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

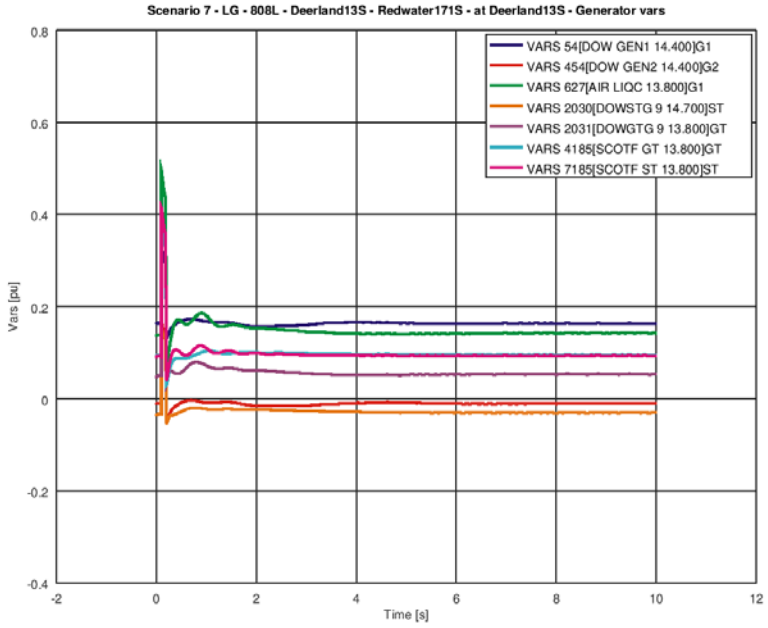


Figure A-889 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

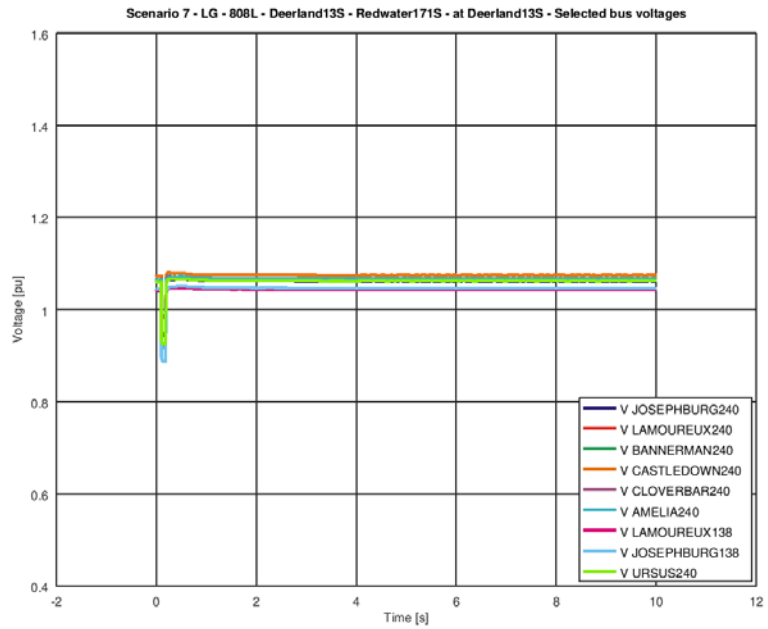


Figure A-890 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

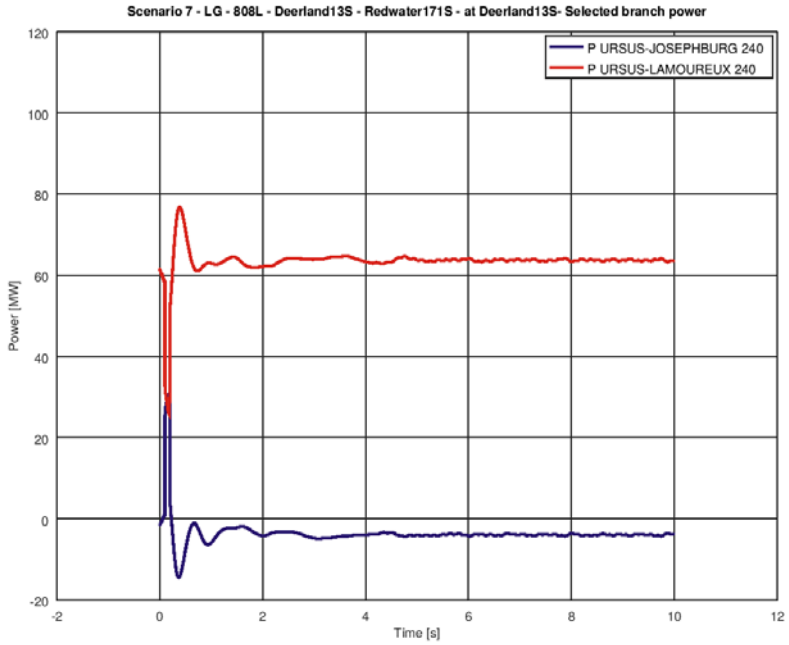


Figure A-891 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

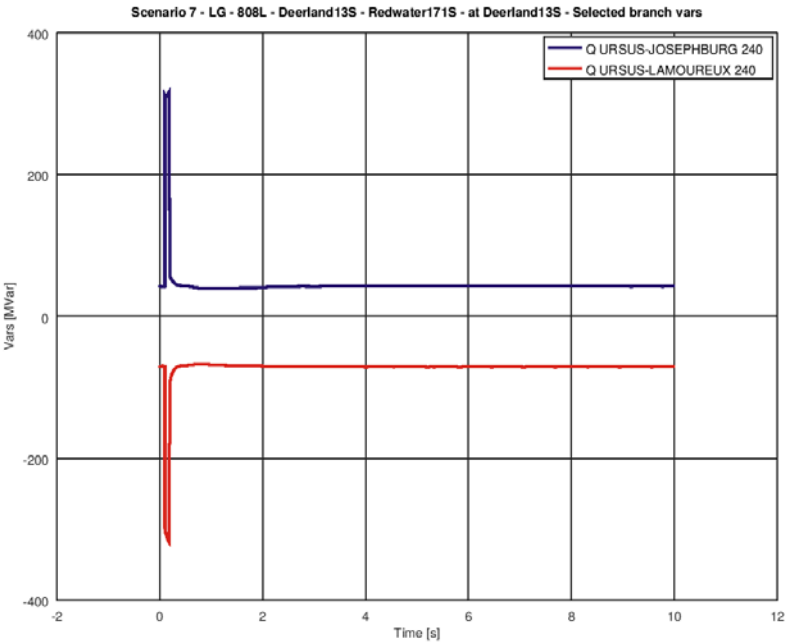


Figure A-892 Scenario 7 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

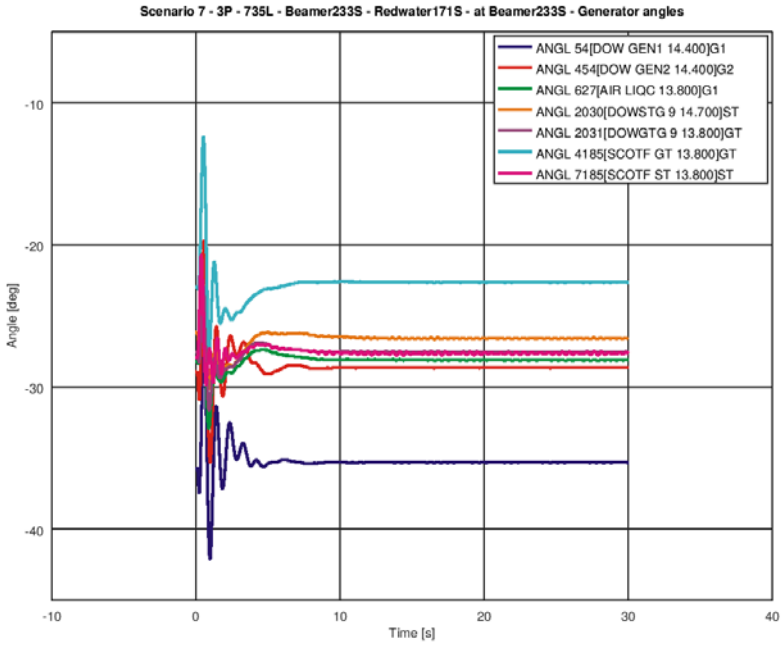


Figure A-893 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

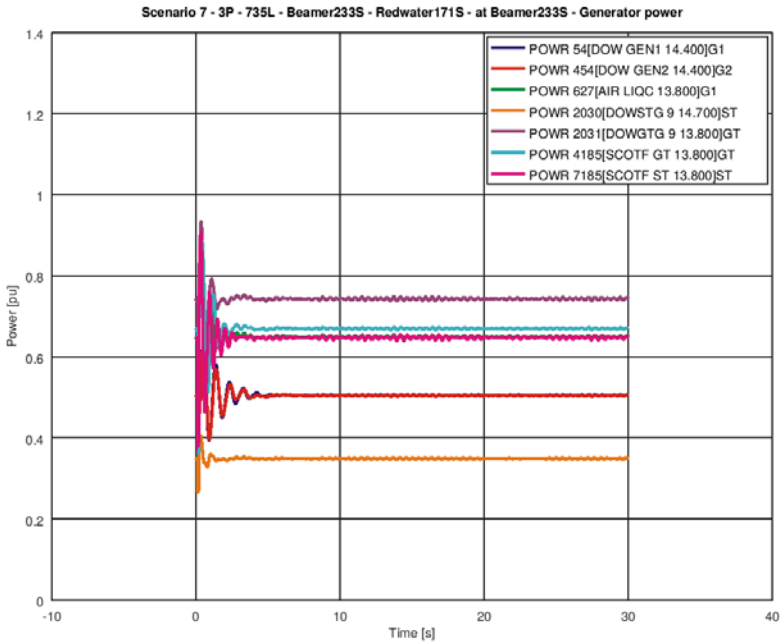


Figure A-894 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

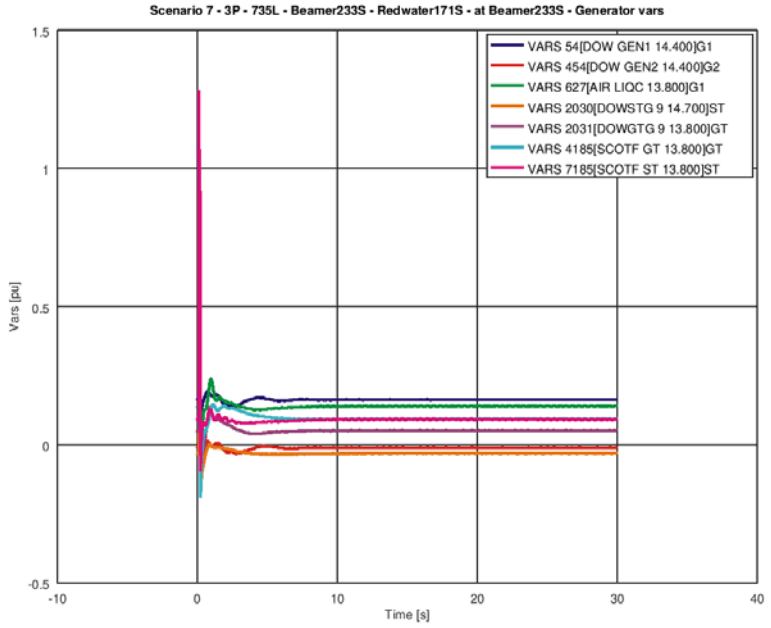


Figure A-895 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

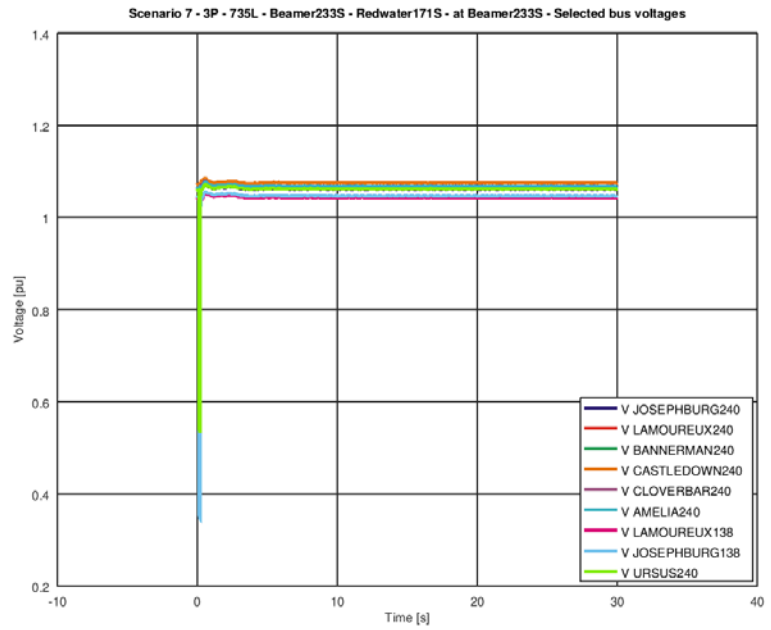


Figure A-896 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

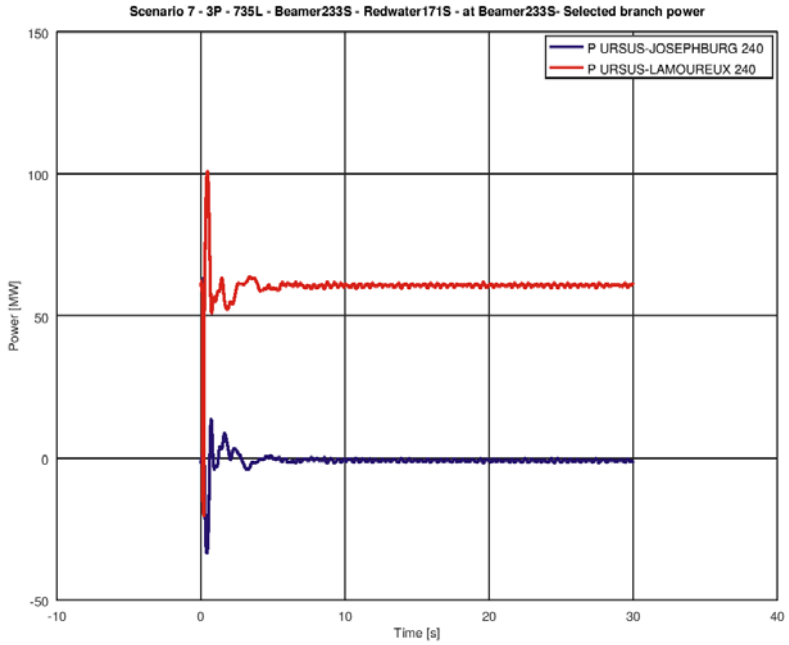


Figure A-897 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

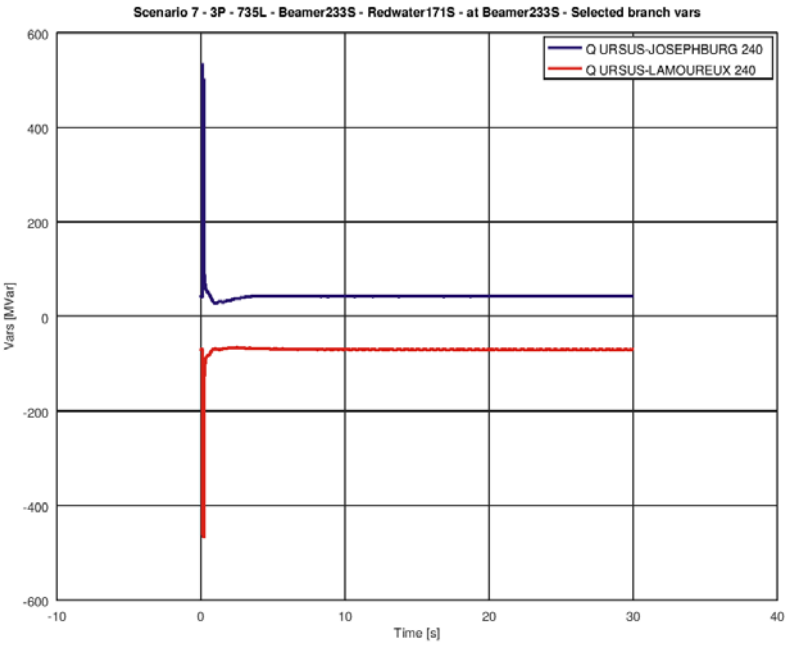


Figure A-898 Scenario 7 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

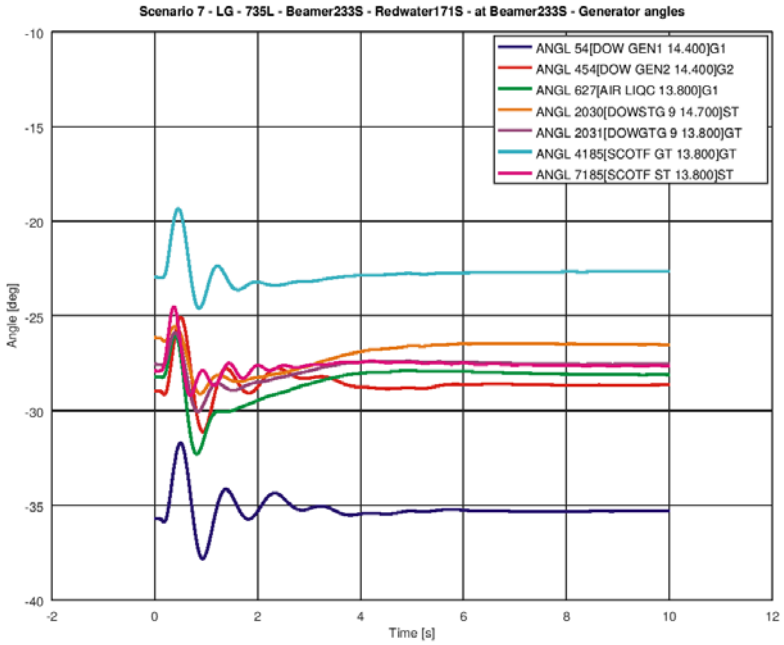


Figure A-899 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

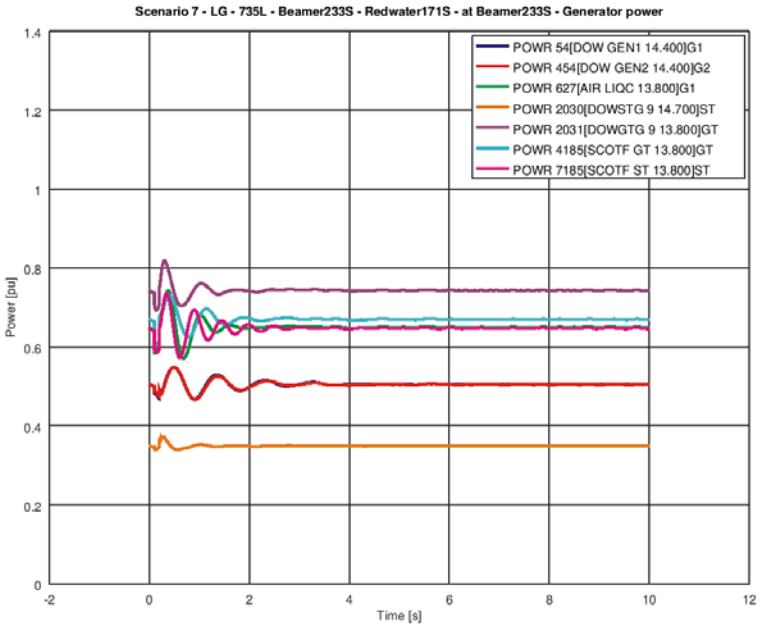


Figure A-900 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

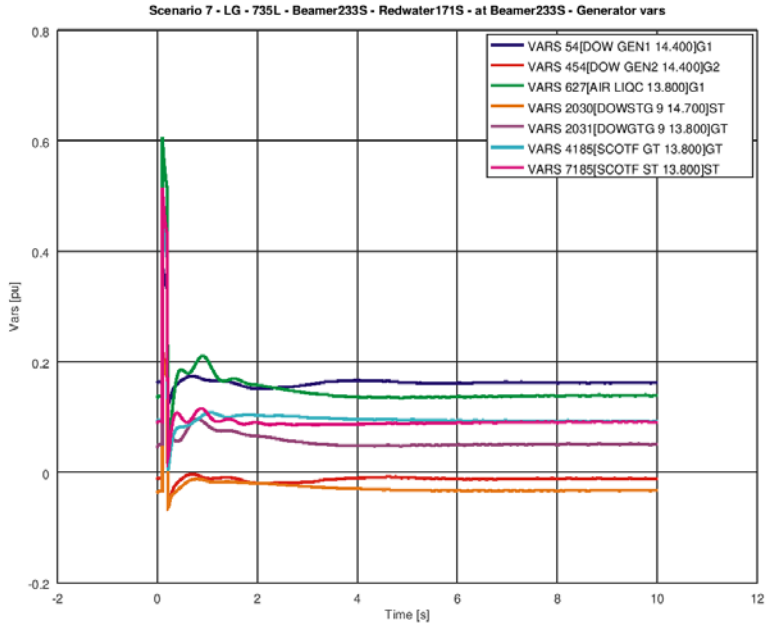


Figure A-901 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

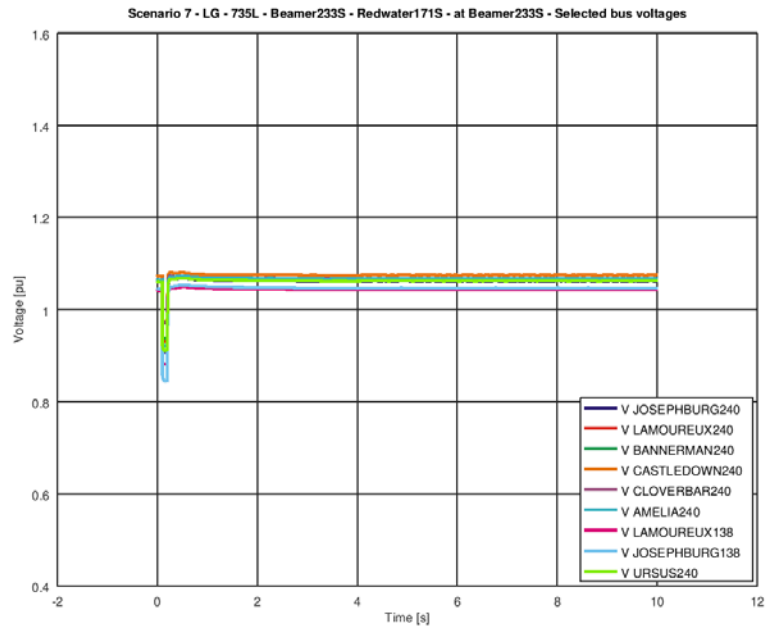


Figure A-902 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

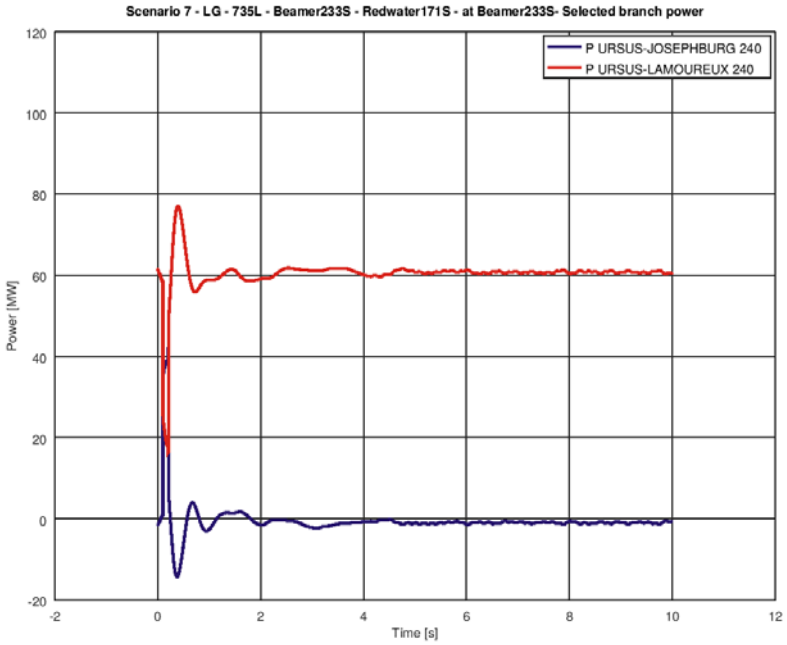


Figure A-903 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

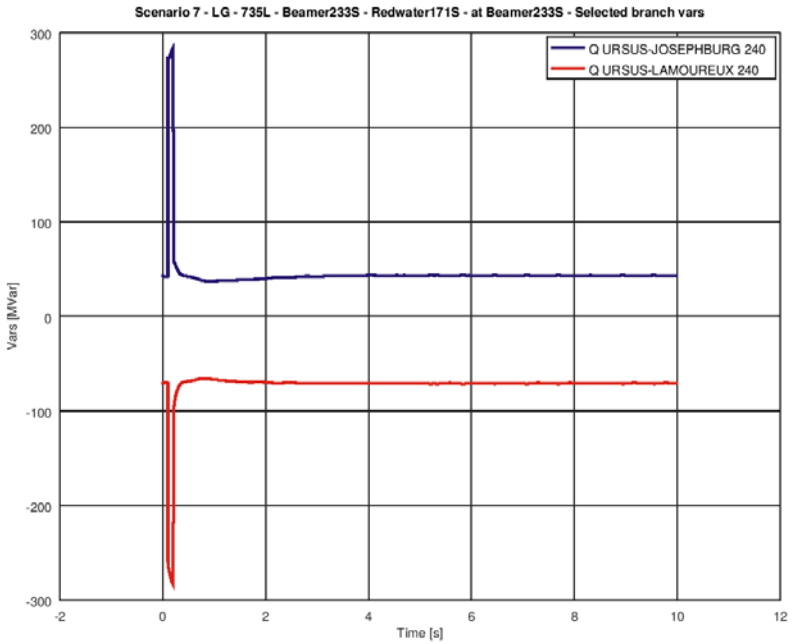


Figure A-904 Scenario 7 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

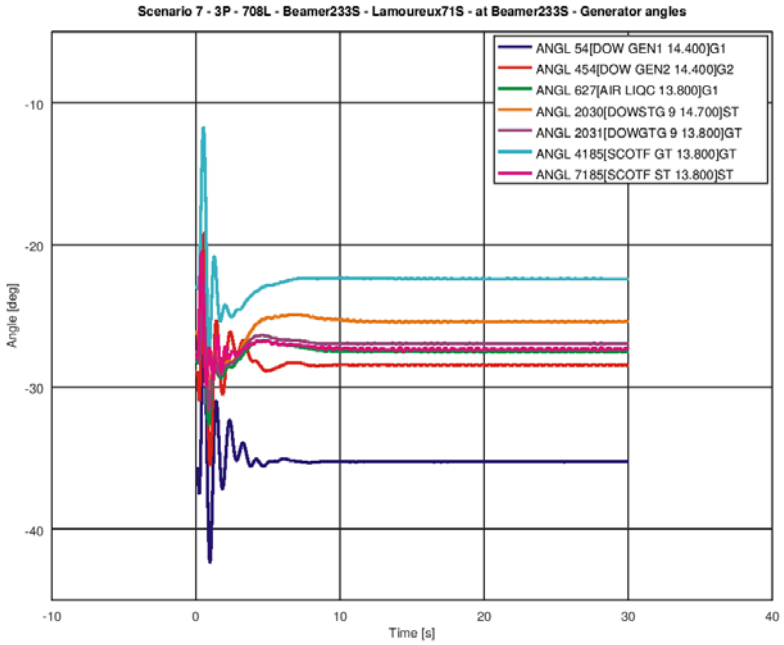


Figure A-905 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

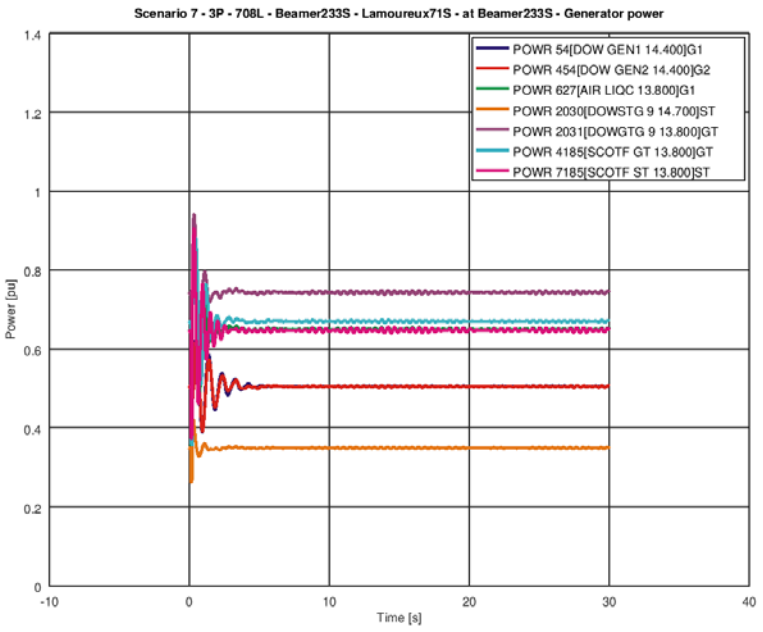


Figure A-906 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

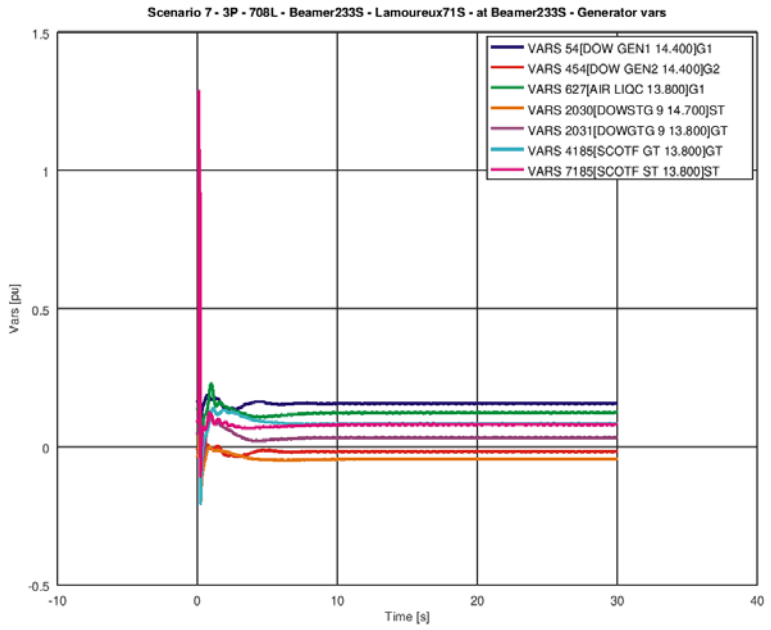


Figure A-907 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

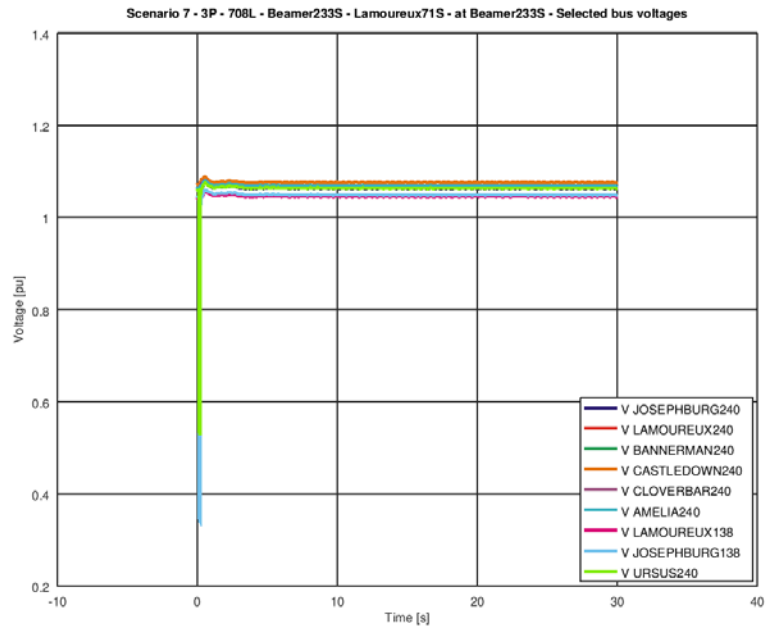


Figure A-908 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

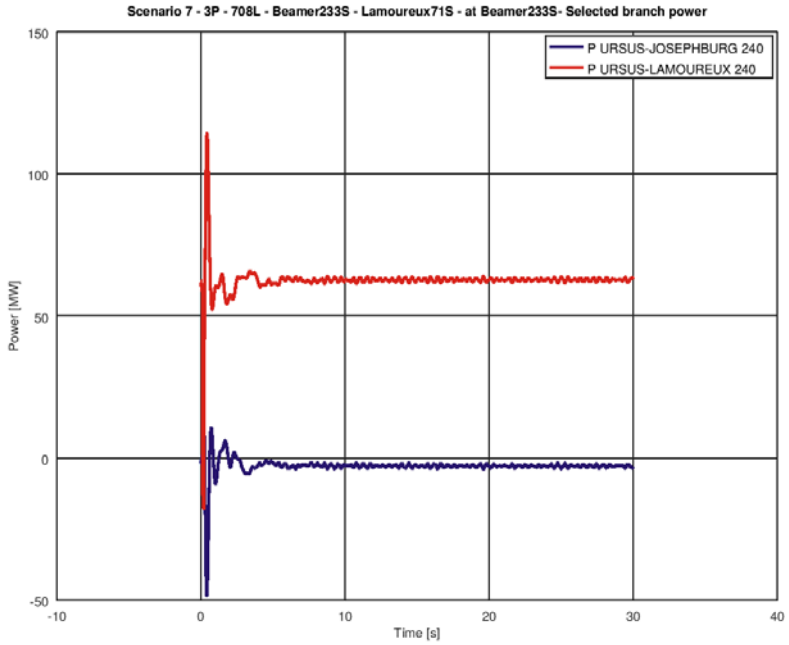


Figure A-909 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

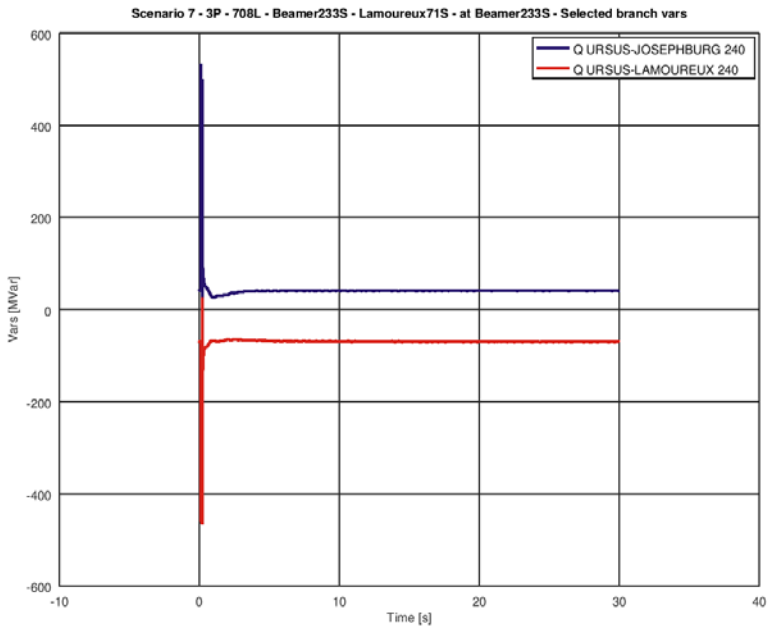


Figure A-910 Scenario 7 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

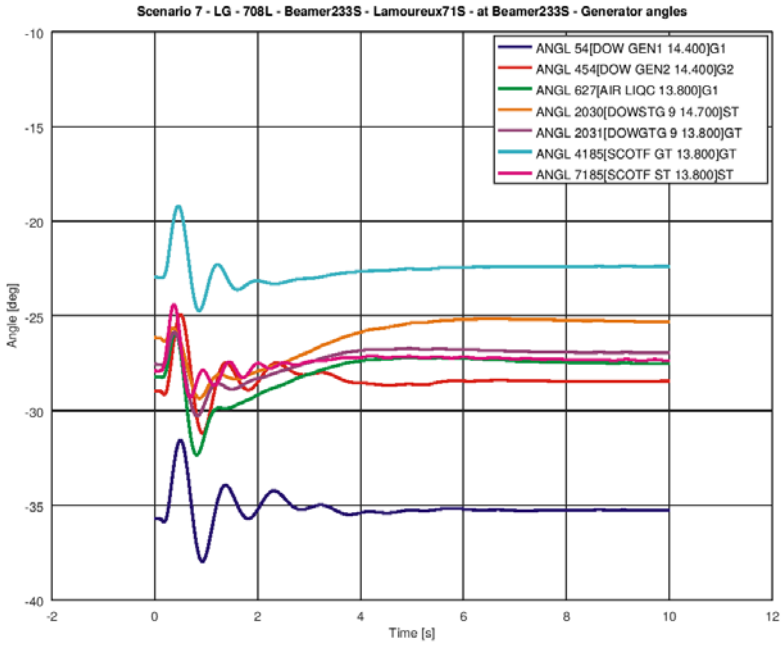


Figure A-911 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

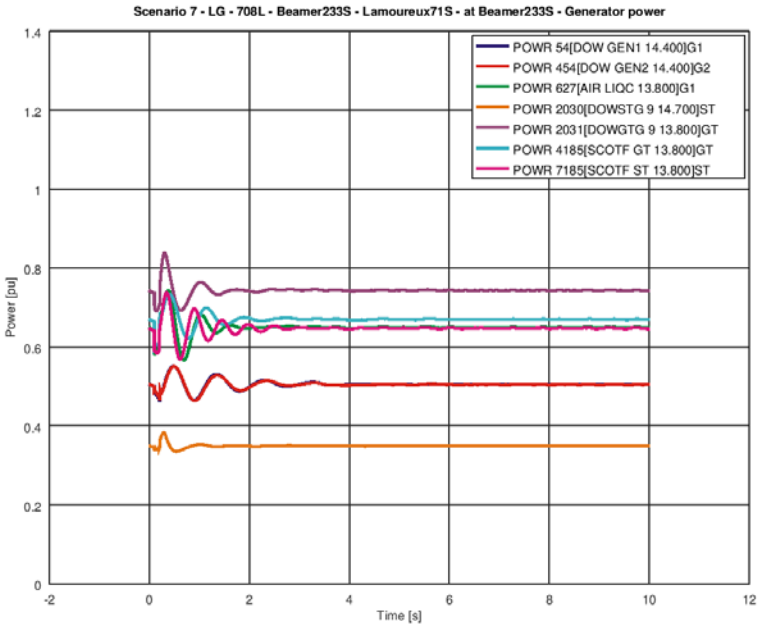


Figure A-912 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

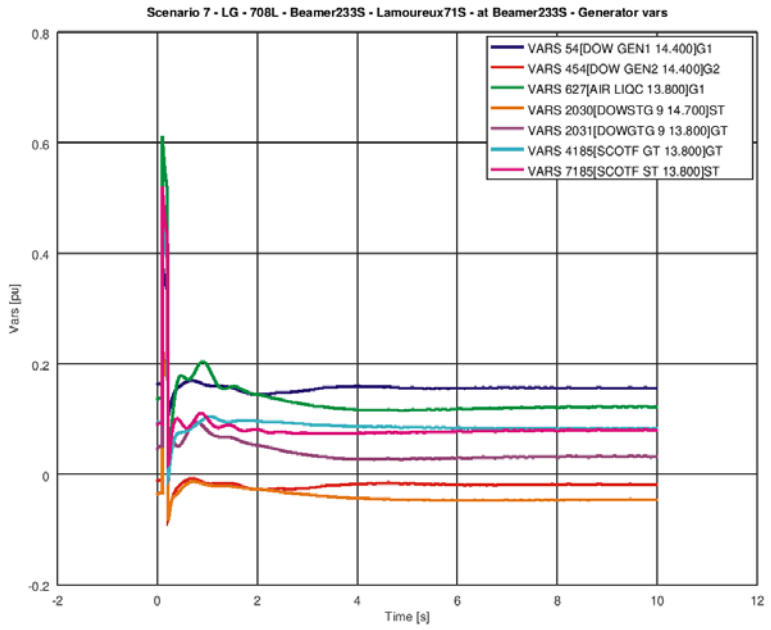


Figure A-913 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

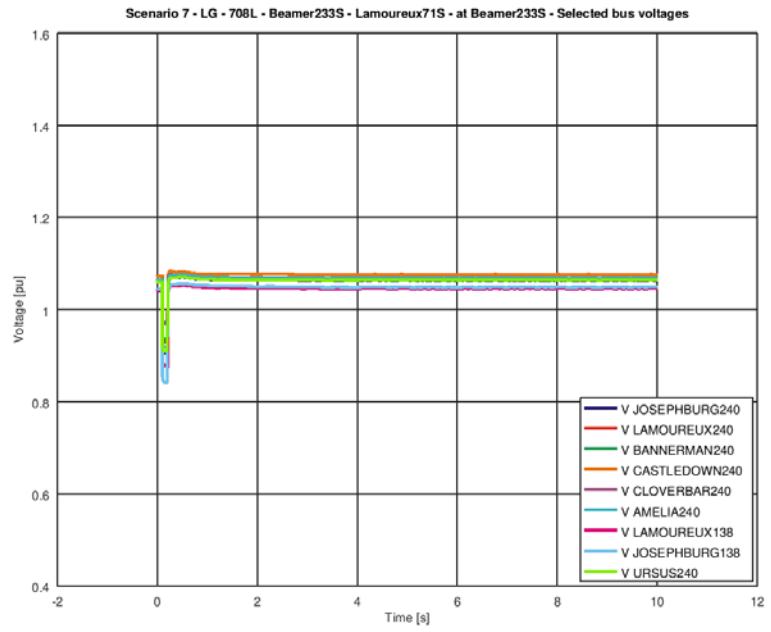


Figure A-914 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

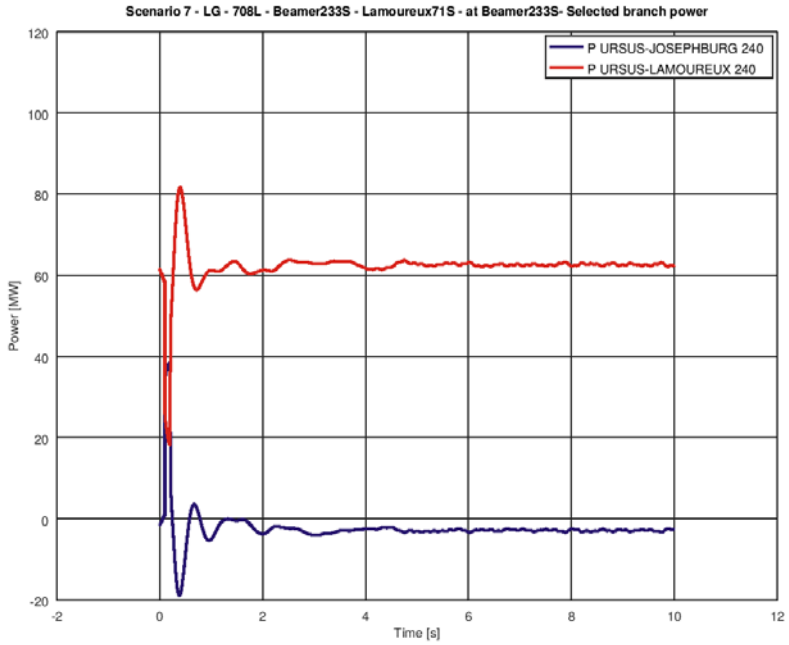


Figure A-915 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

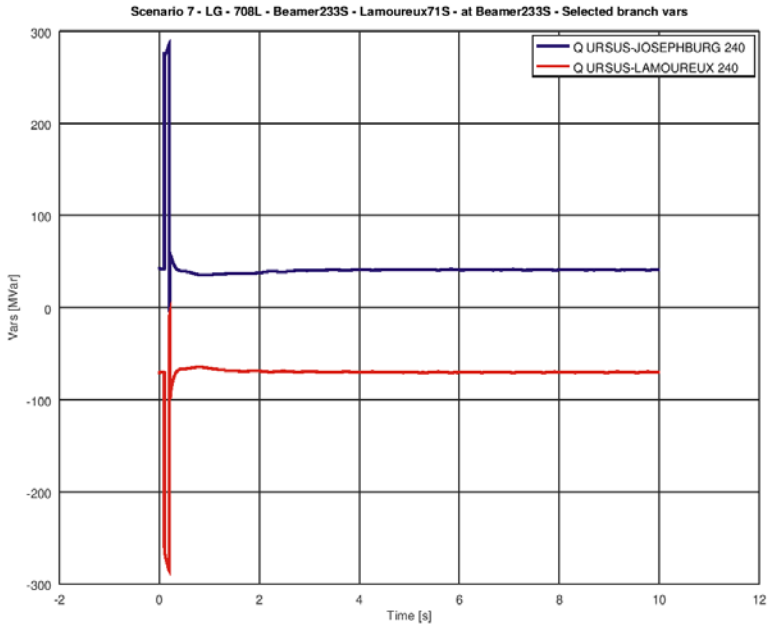


Figure A-916 Scenario 7 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

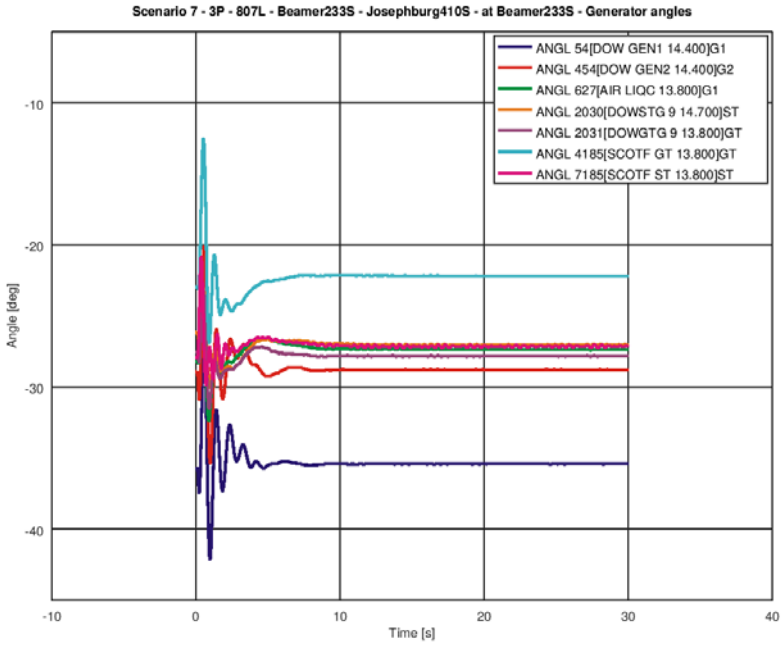


Figure A-917 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

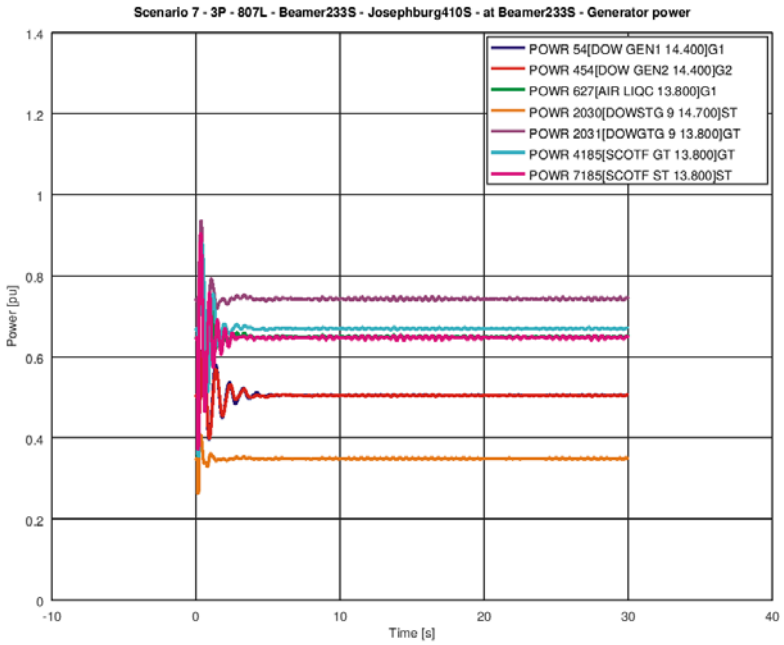


Figure A-918 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

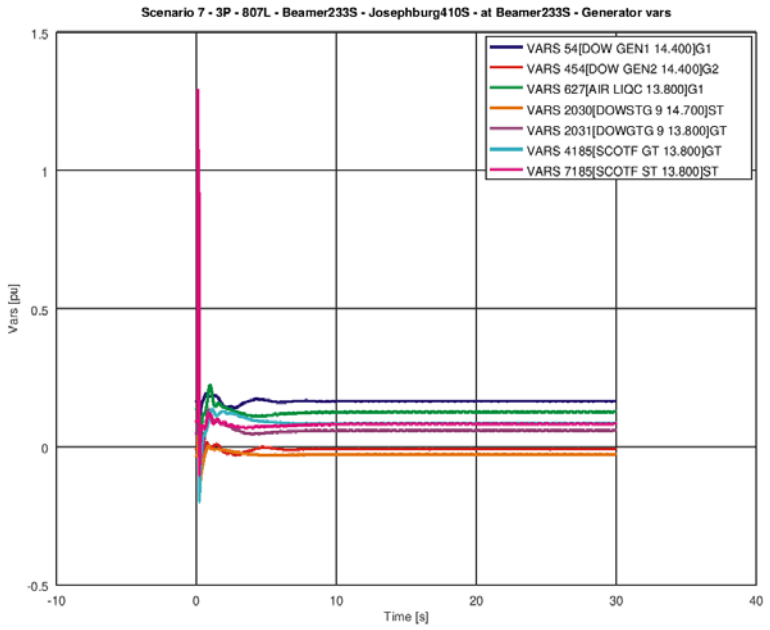


Figure A-919 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

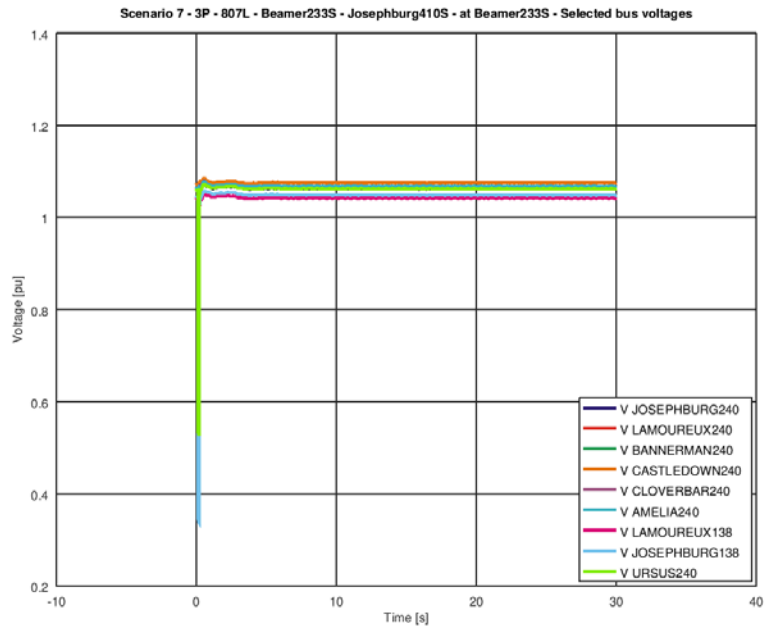


Figure A-920 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

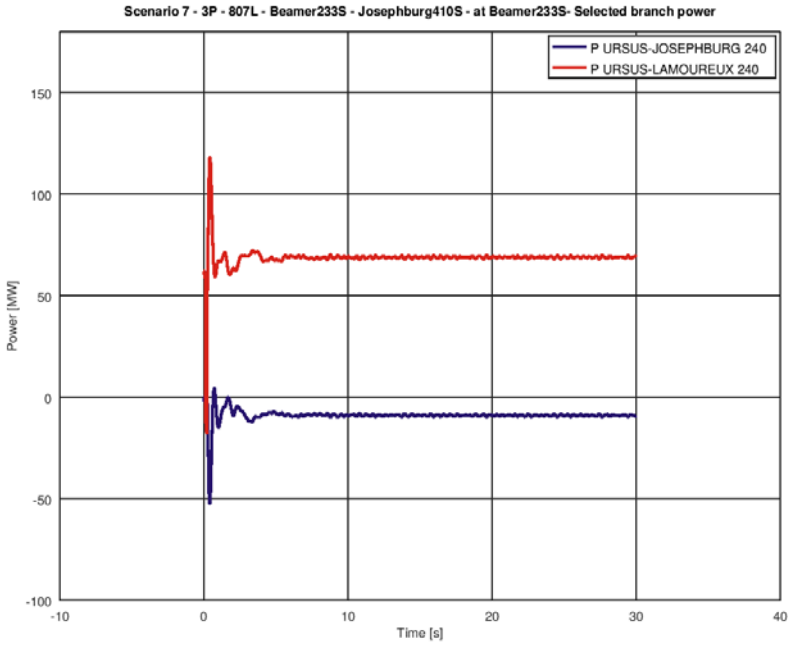


Figure A-921 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

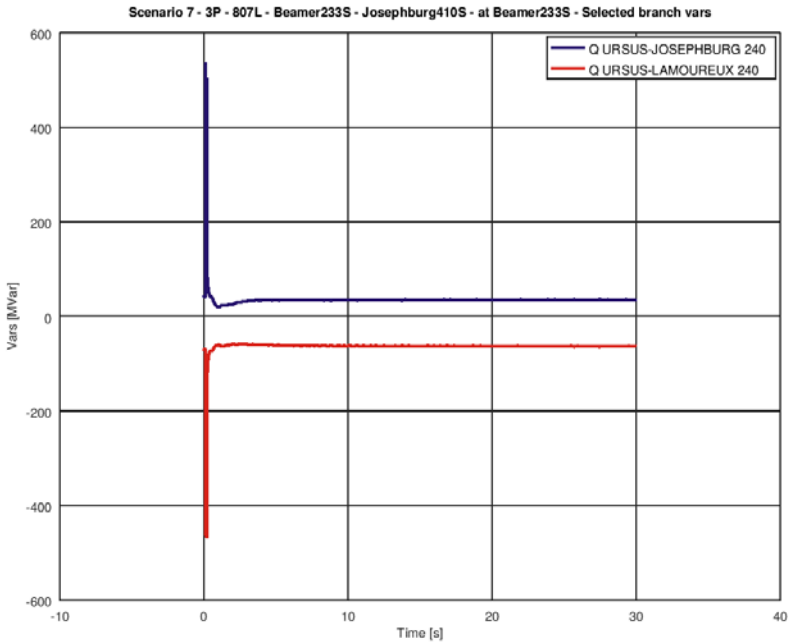


Figure A-922 Scenario 7 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

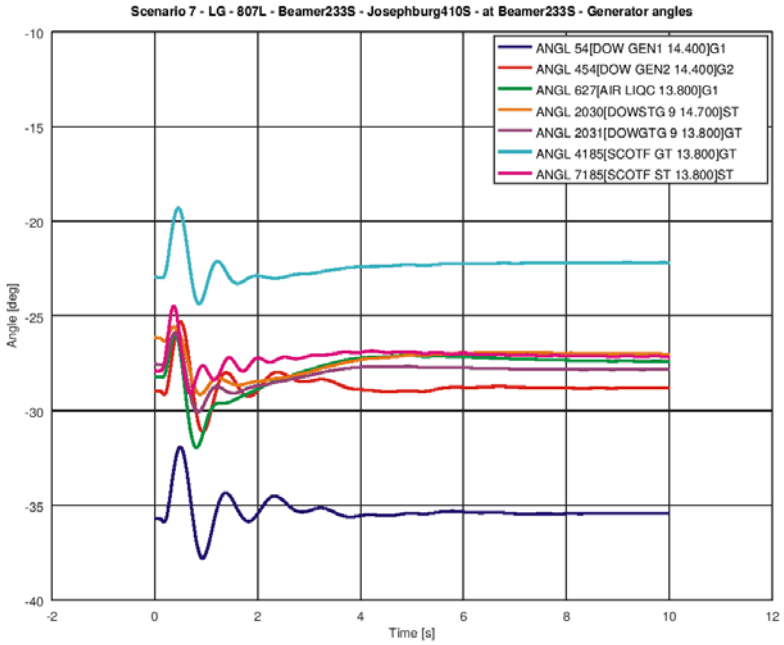


Figure A-923 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

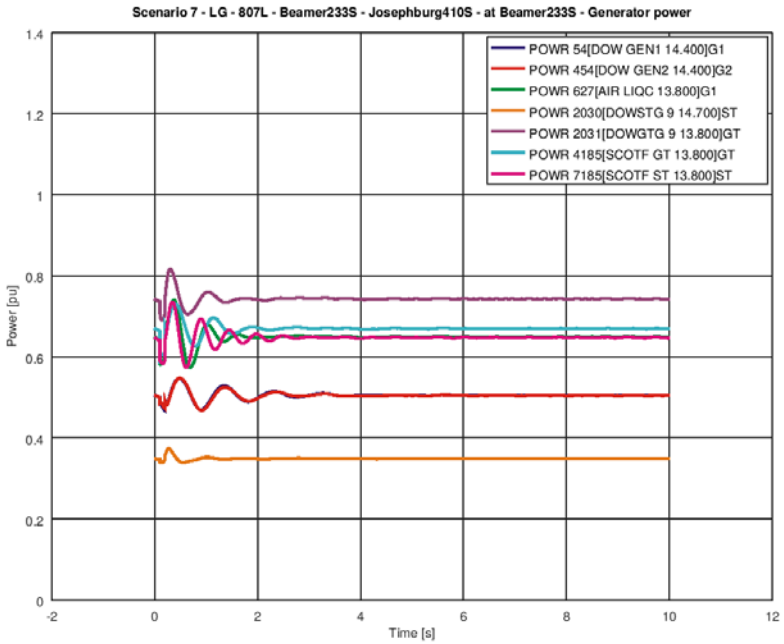


Figure A-924 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

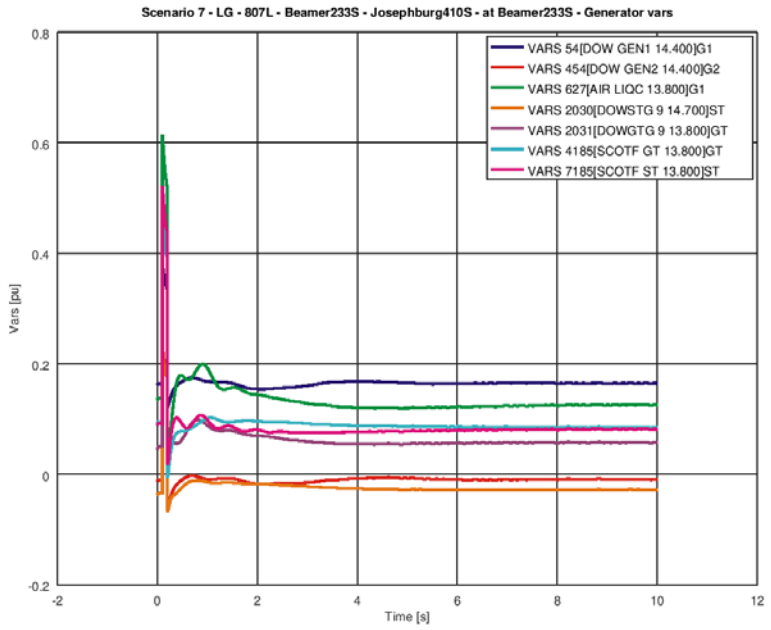


Figure A-925 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

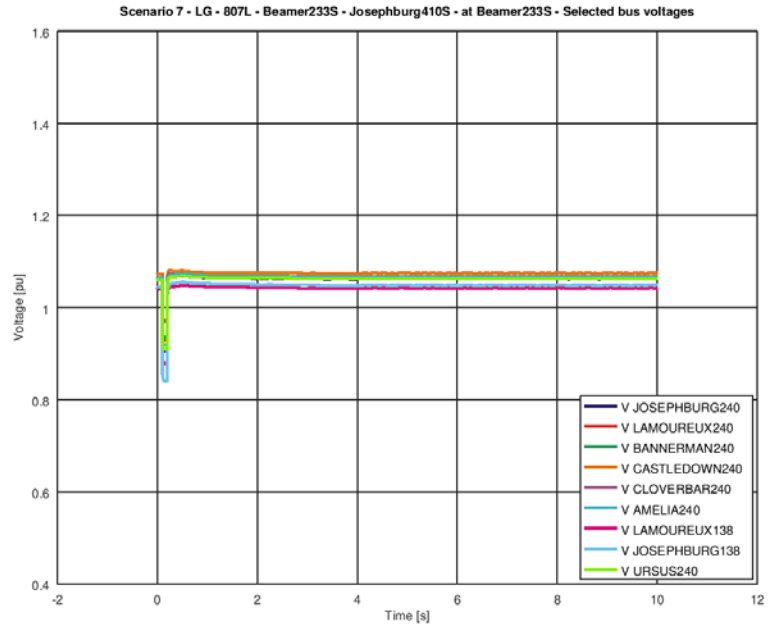


Figure A-926 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

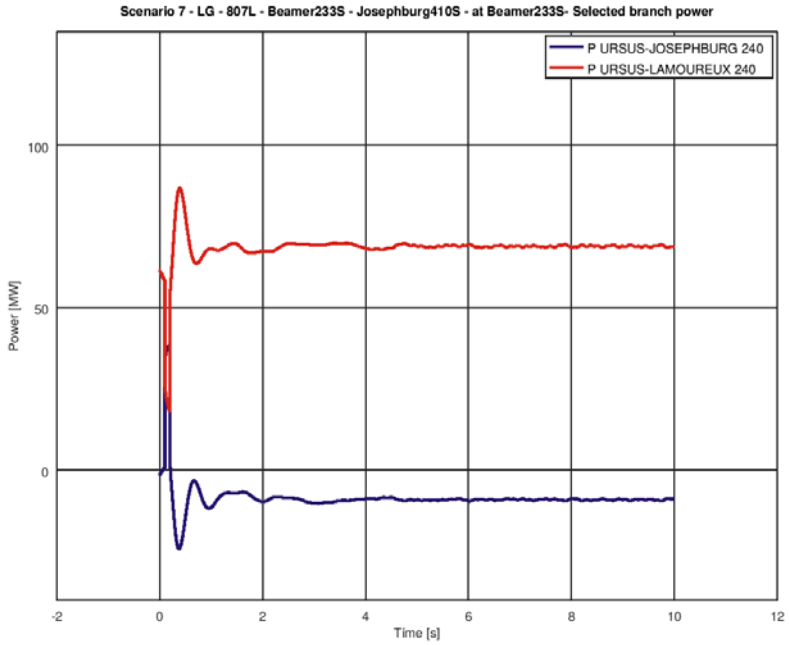


Figure A-927 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

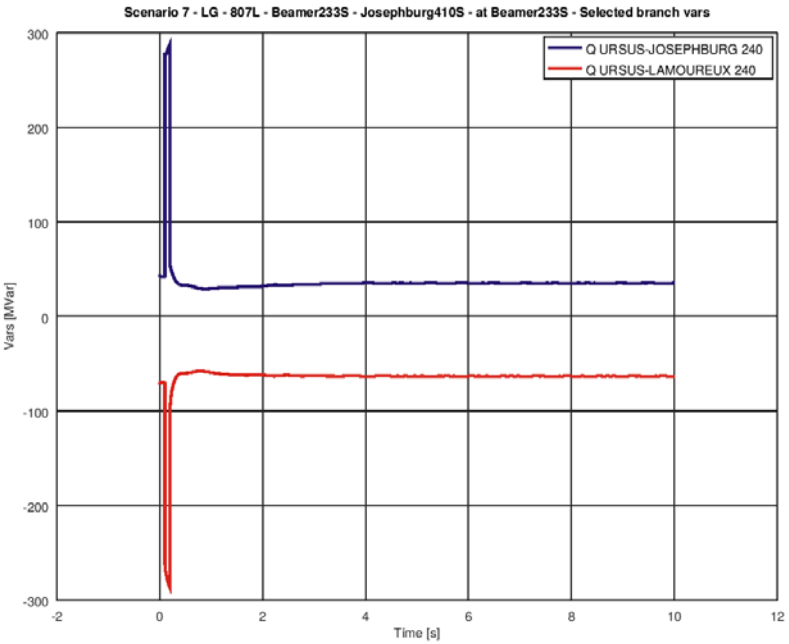


Figure A-928 Scenario 7 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

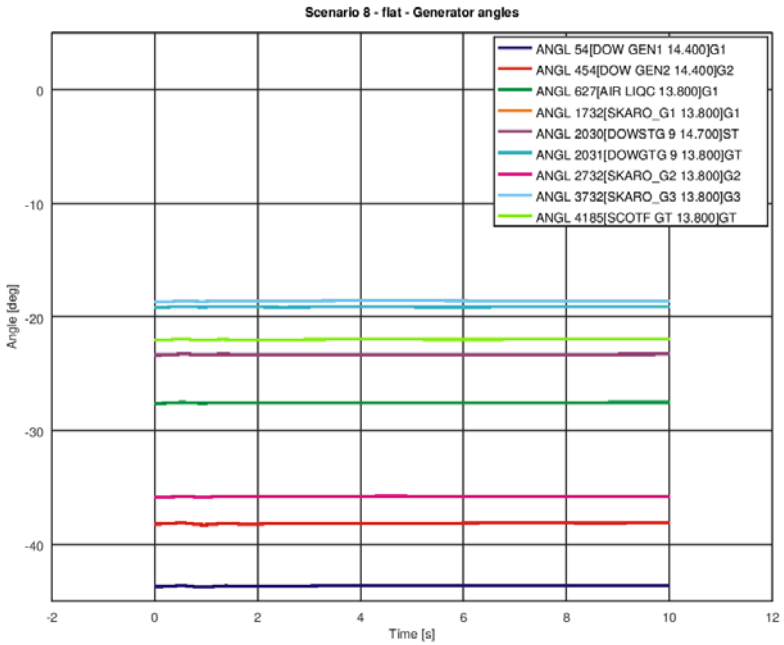


Figure A-929 Scenario 8 - flat - Generator angles

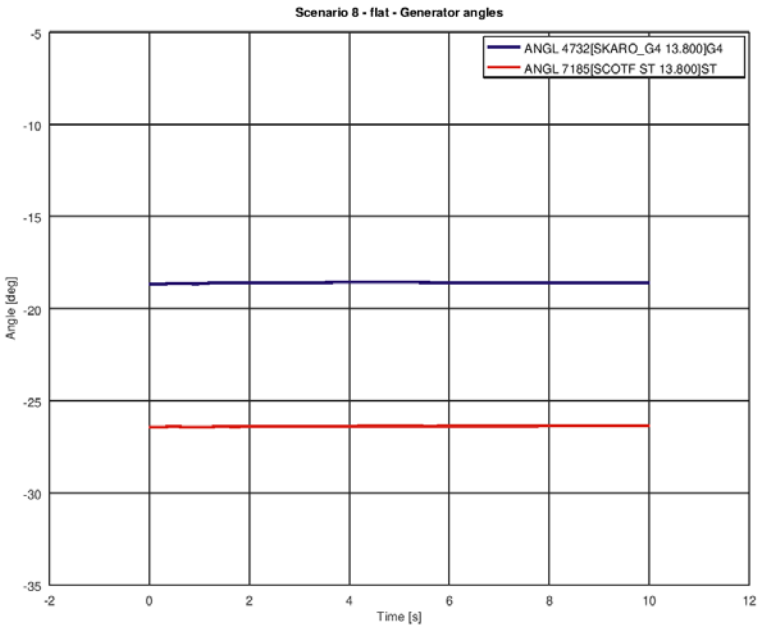


Figure A-930 Scenario 8 - flat - Generator angles

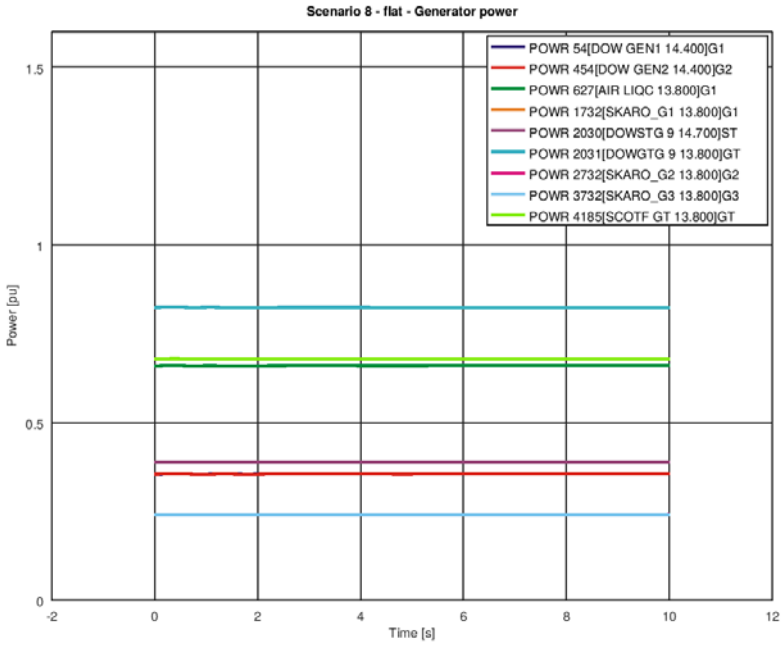


Figure A-931 Scenario 8 - flat - Generator power

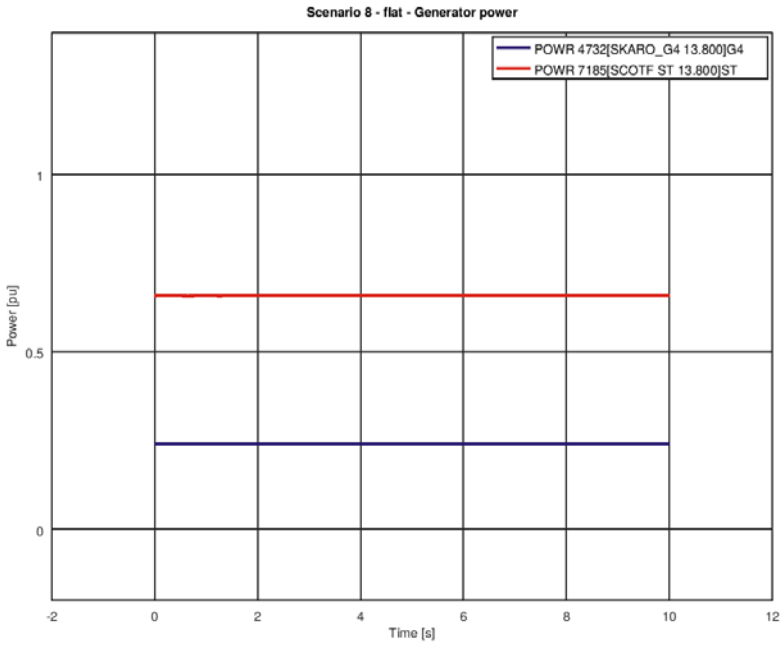


Figure A-932 Scenario 8 - flat - Generator power

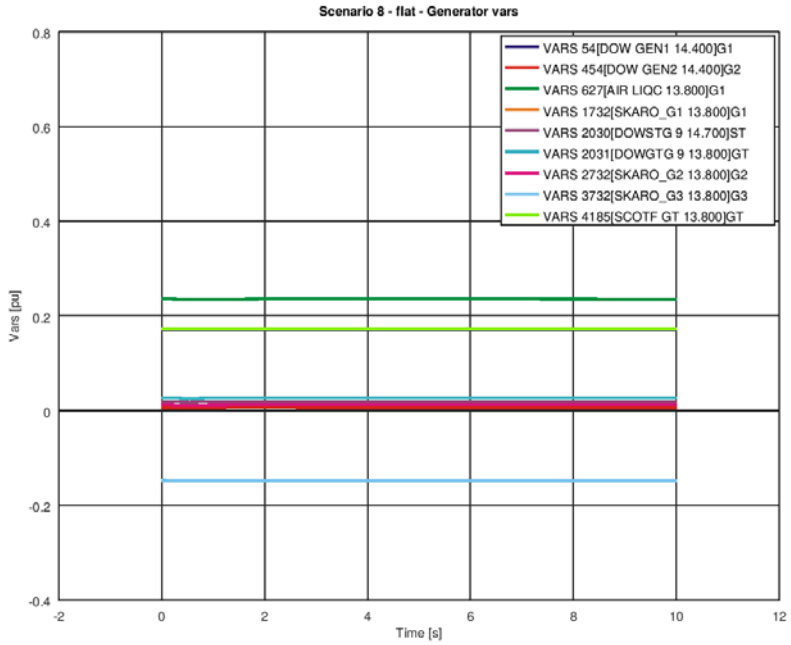


Figure A-933 Scenario 8 - flat - Generator vars

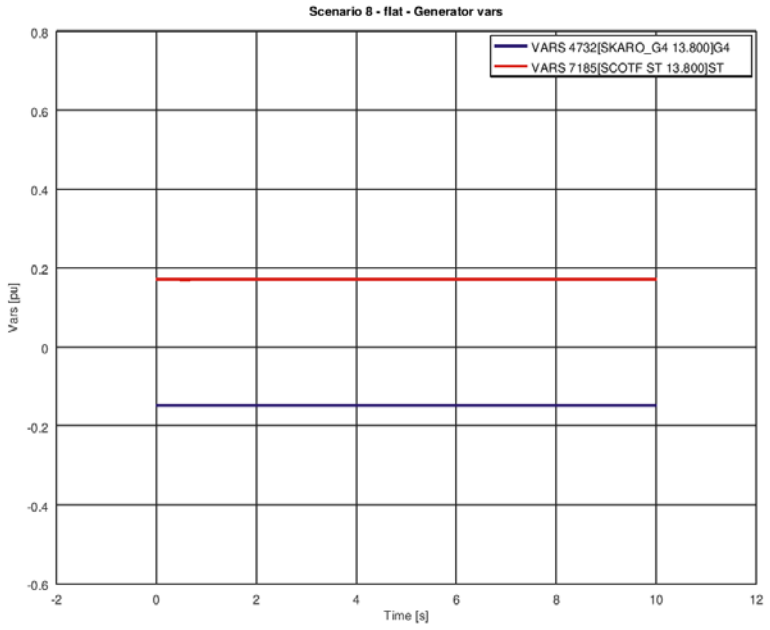


Figure A-934 Scenario 8 - flat - Generator vars

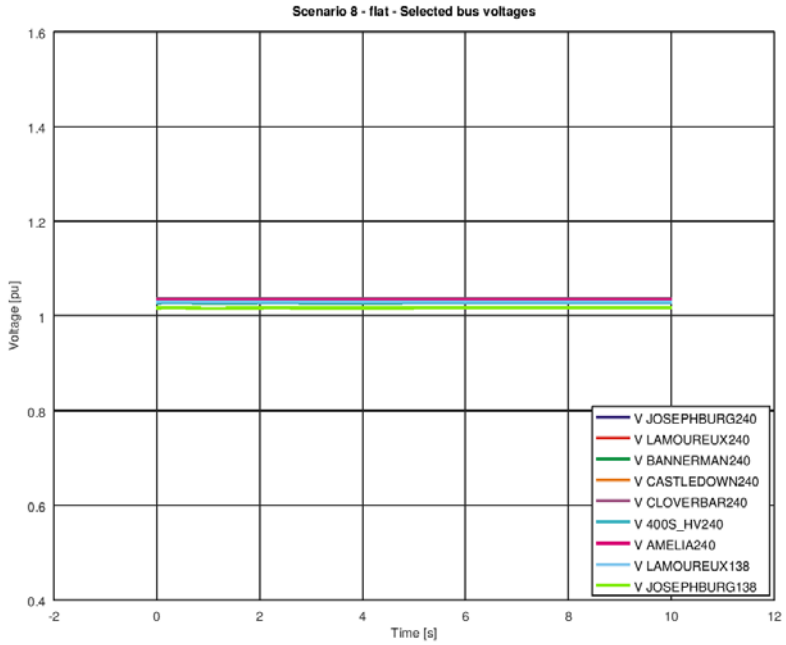


Figure A-935 Scenario 8 - flat - Selected bus voltages

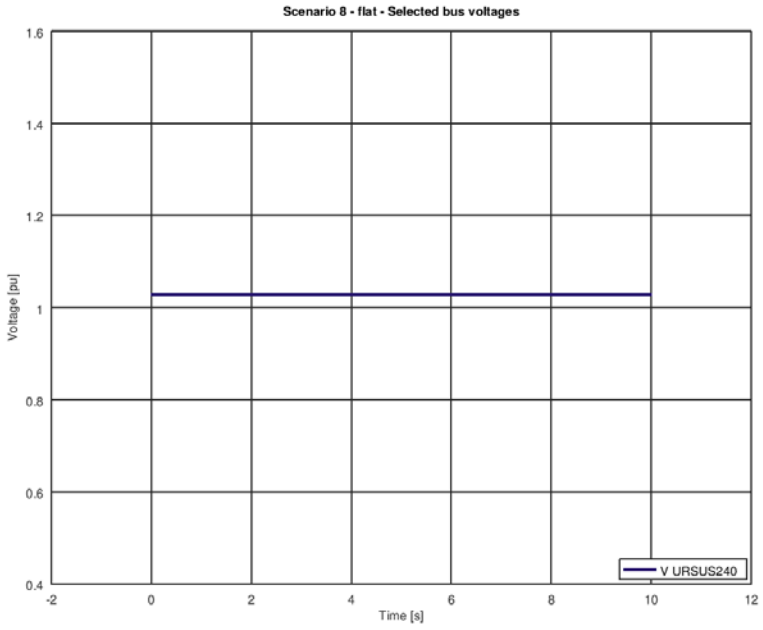


Figure A-936 Scenario 8 - flat - Selected bus voltages

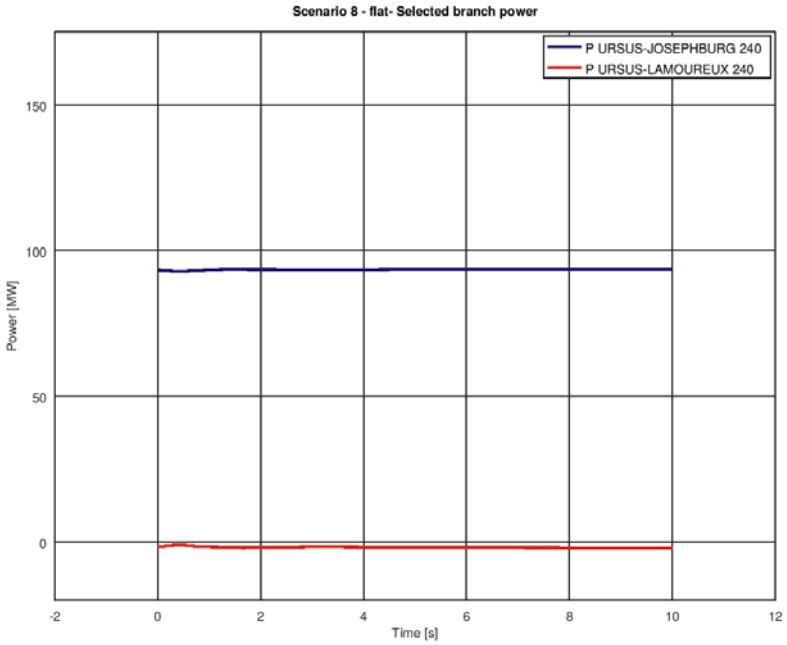


Figure A-937 Scenario 8 - flat - Selected branch power

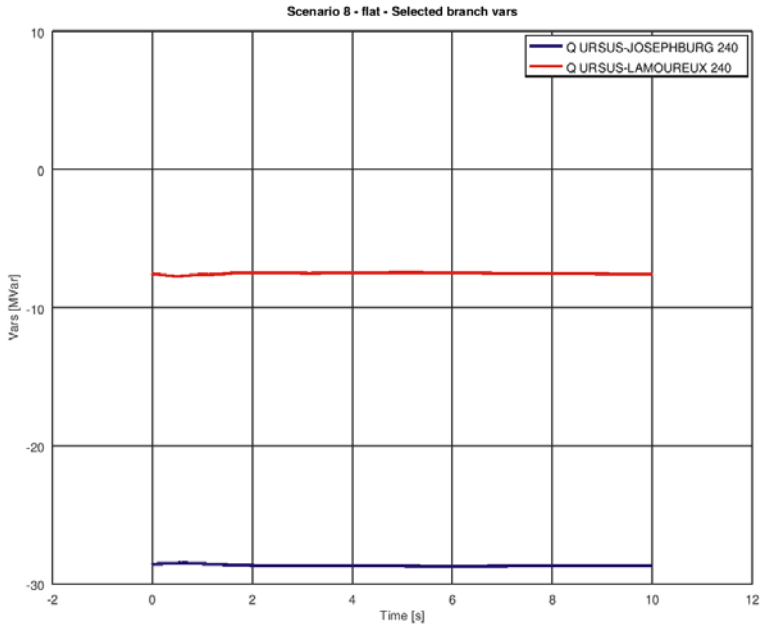


Figure A-938 Scenario 8 - flat - Selected branch vars

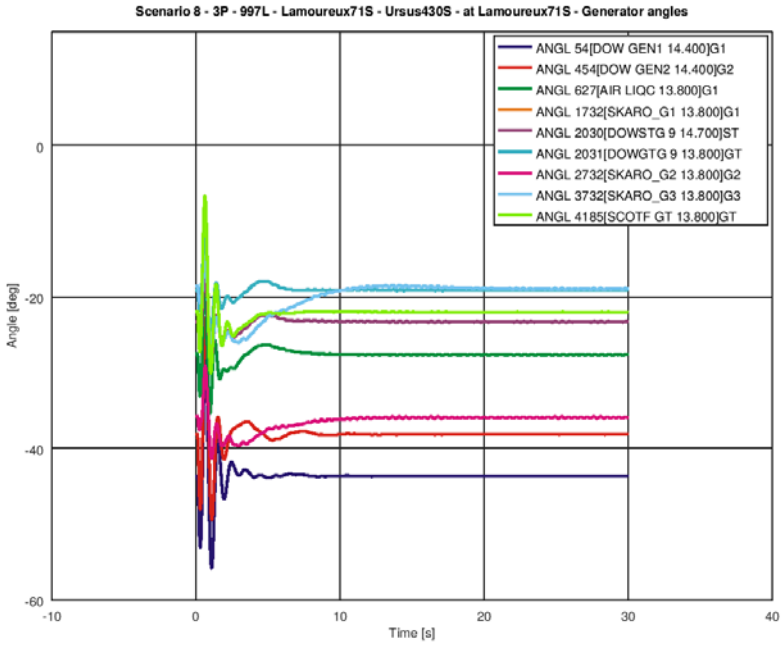


Figure A-939 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

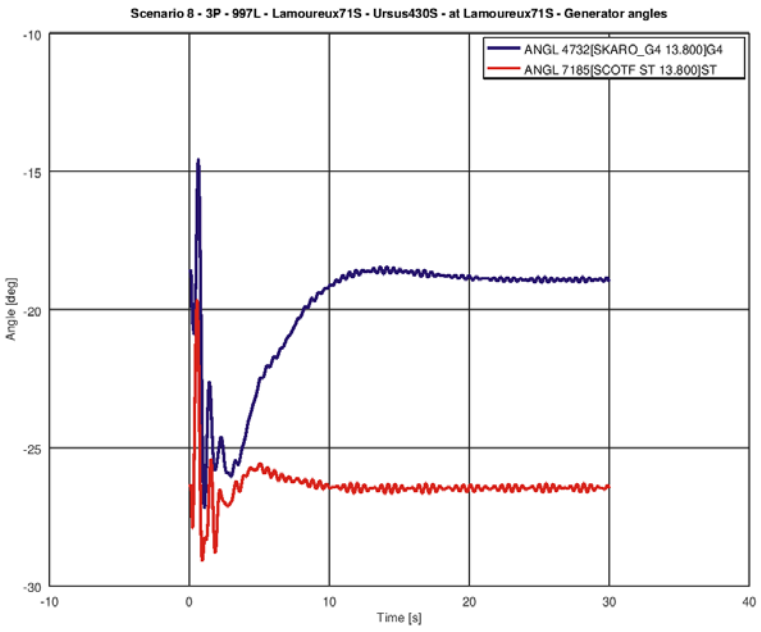


Figure A-940 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

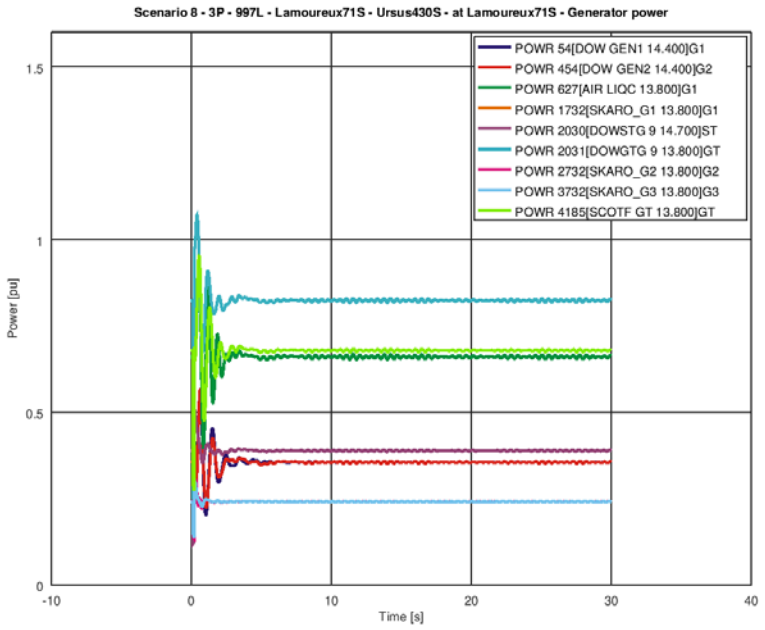


Figure A-941 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

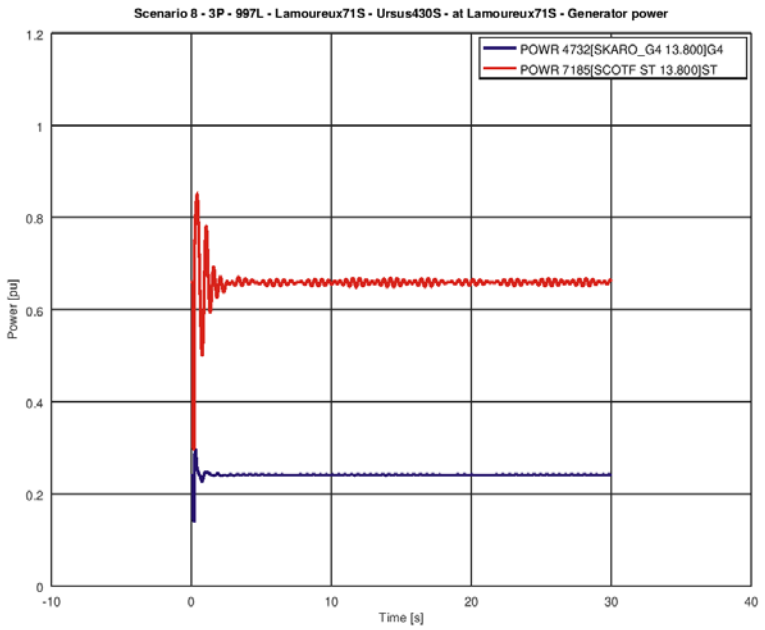


Figure A-942 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

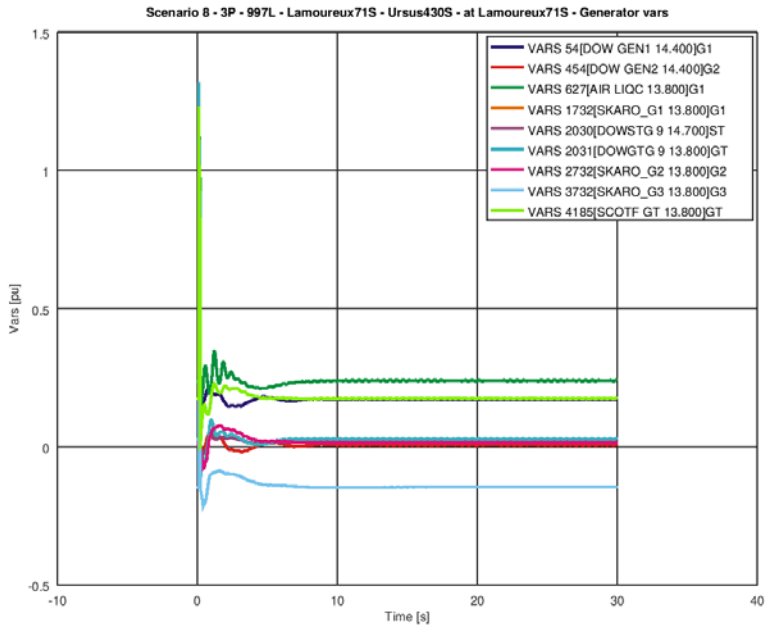


Figure A-943 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

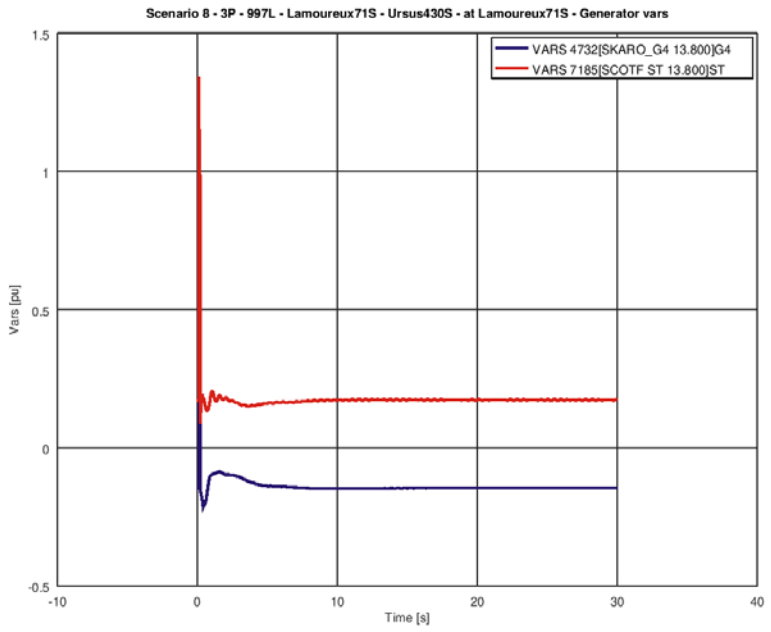


Figure A-944 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

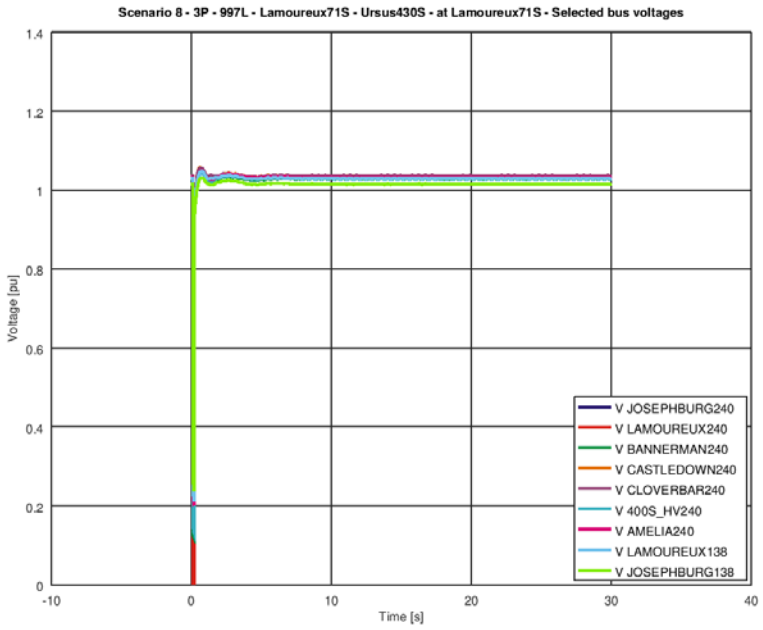


Figure A-945 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

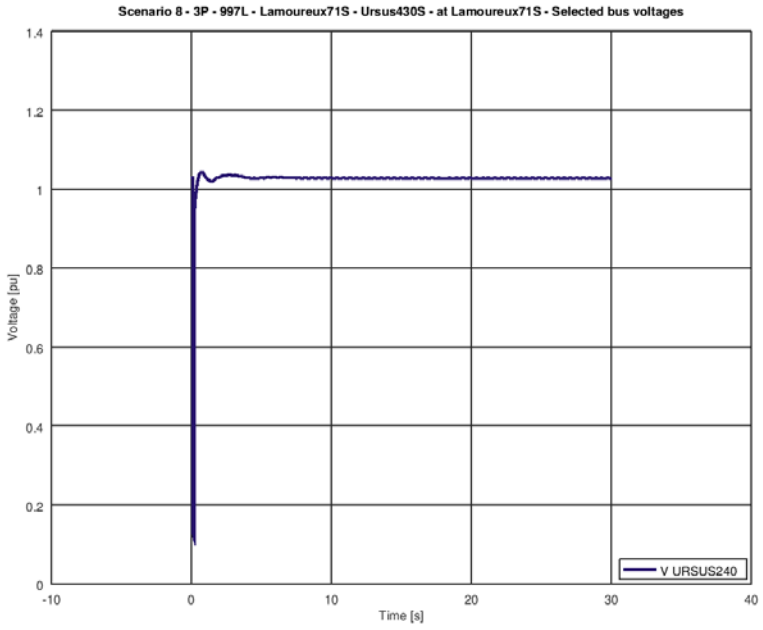


Figure A-946 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

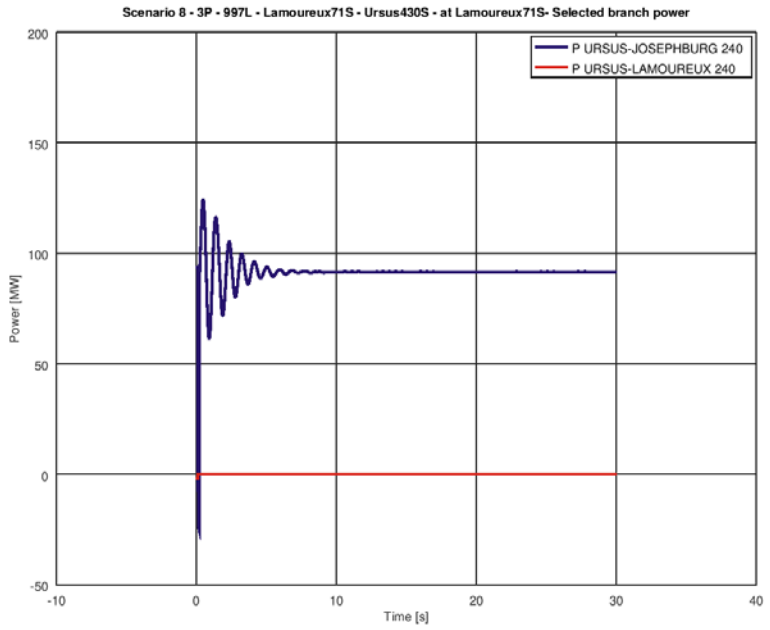


Figure A-947 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

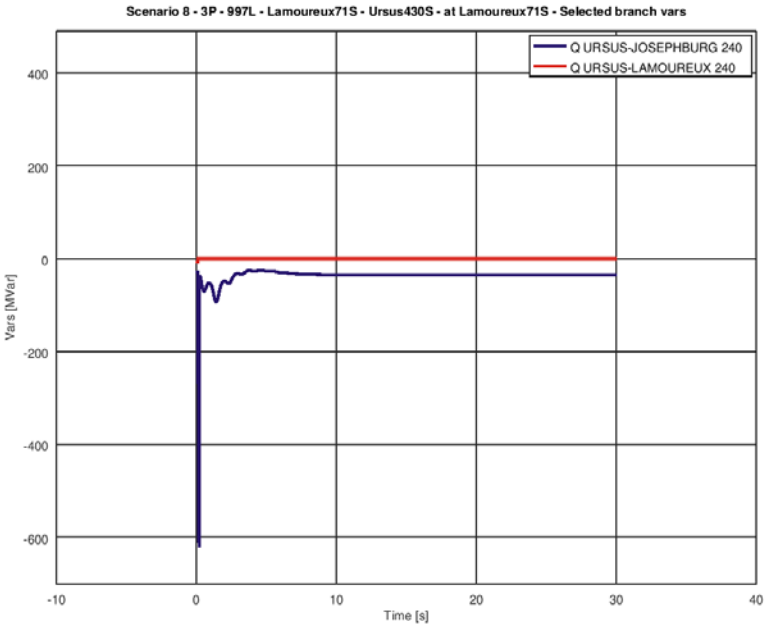


Figure A-948 Scenario 8 - 3P - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

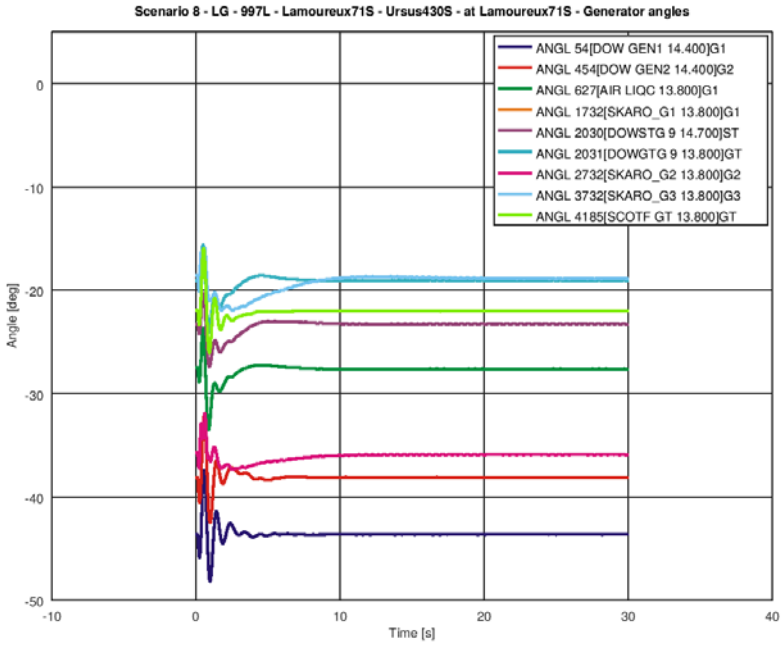


Figure A-949 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

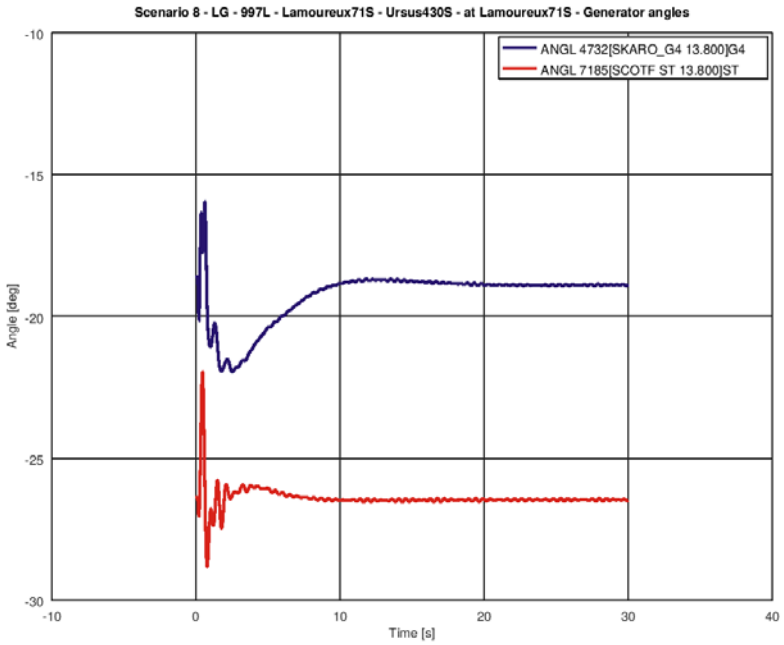


Figure A-950 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator angles

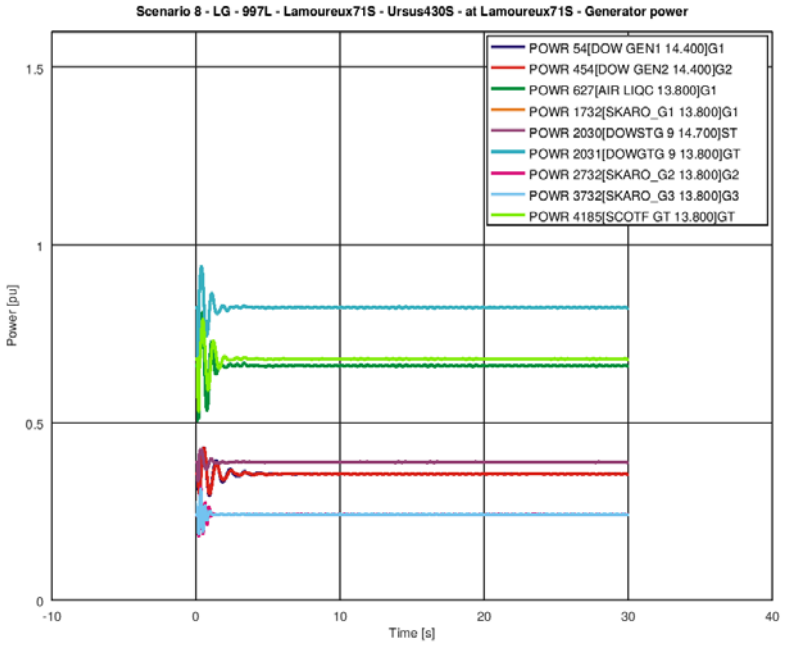


Figure A-951 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

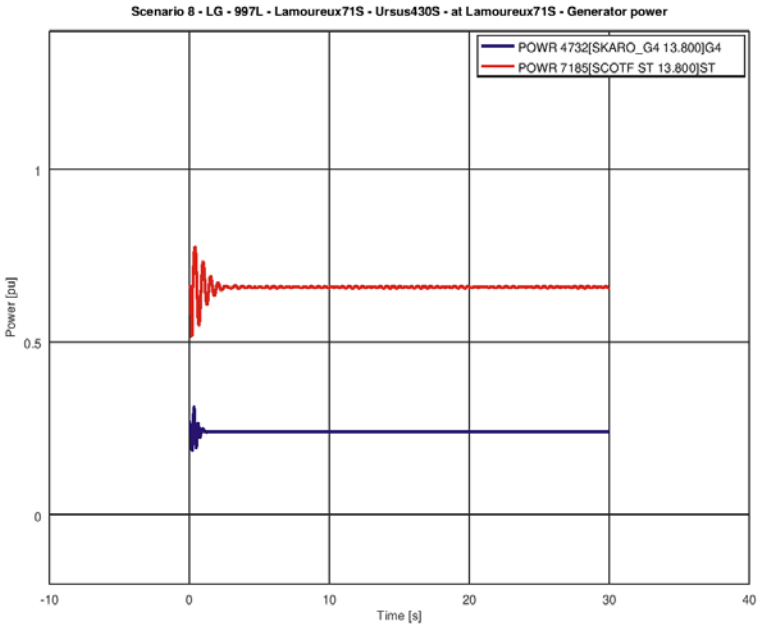


Figure A-952 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator power

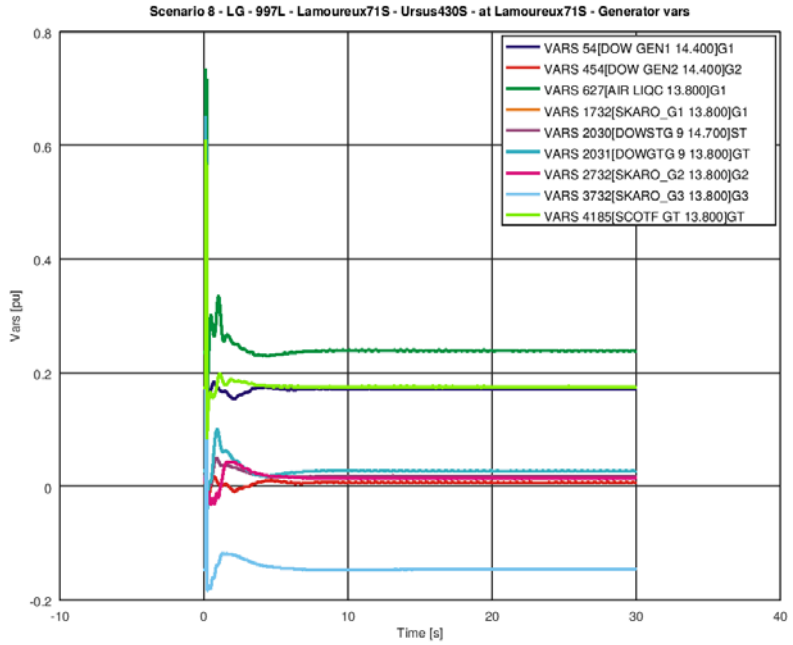


Figure A-953 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

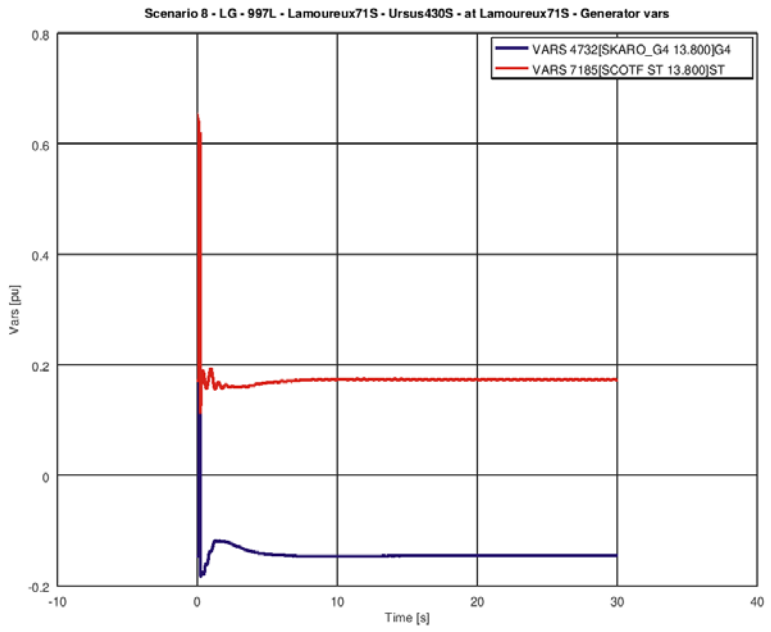


Figure A-954 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Generator vars

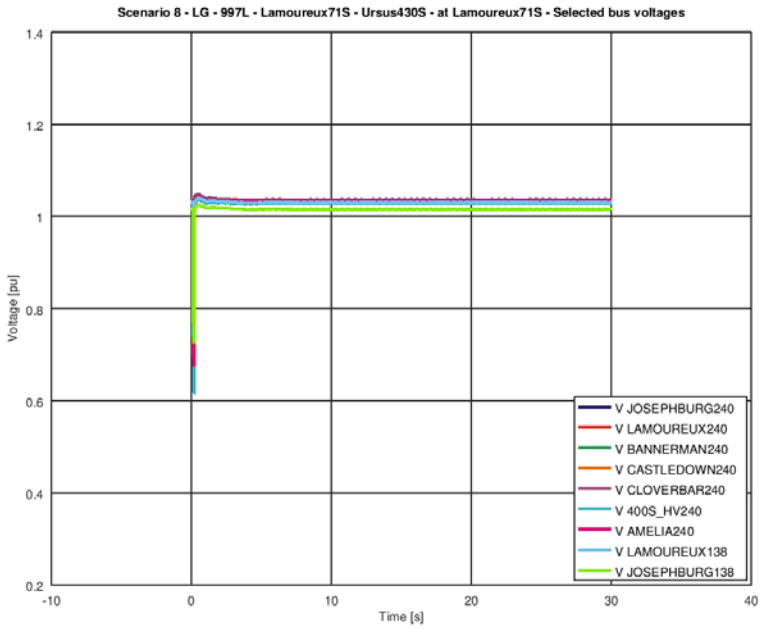


Figure A-955 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

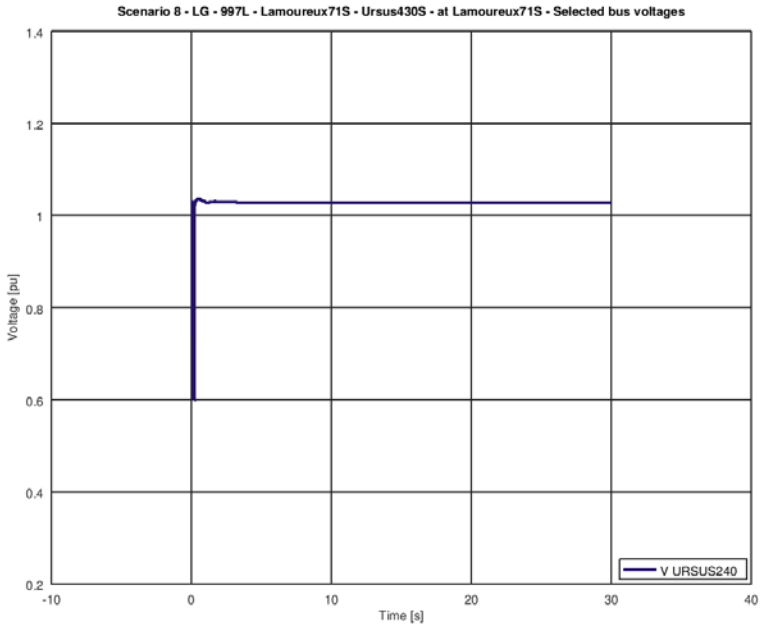


Figure A-956 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected bus voltages

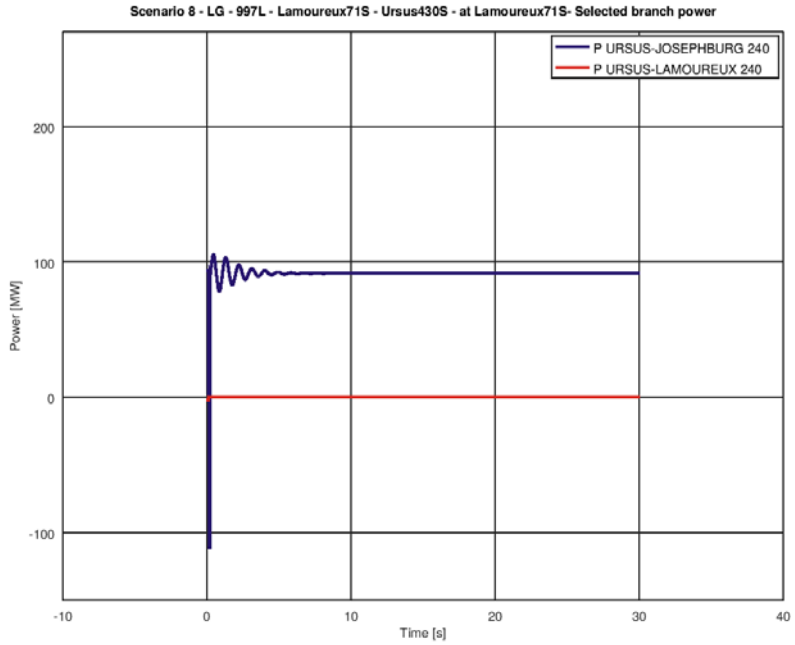


Figure A-957 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch power

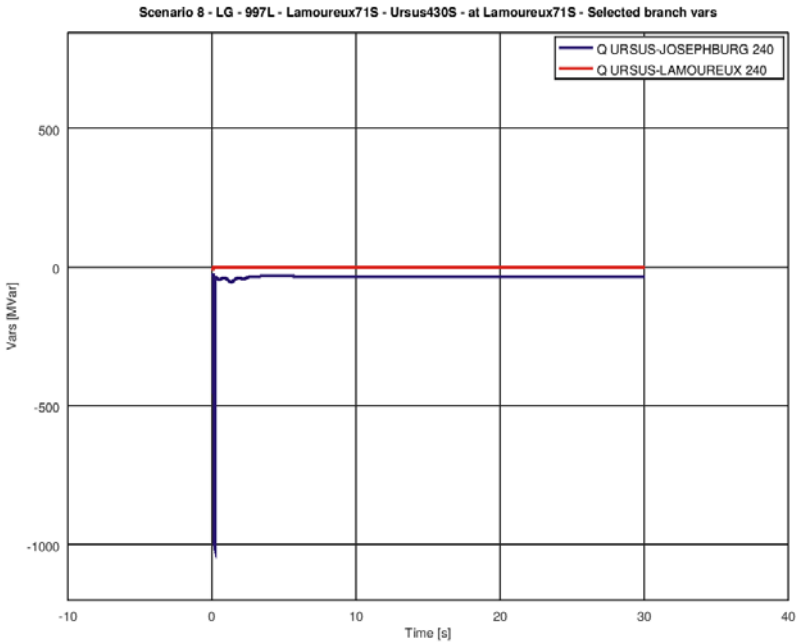


Figure A-958 Scenario 8 - LG - 997L - Lamoureux71S - Ursus430S - at Lamoureux71S - Selected branch vars

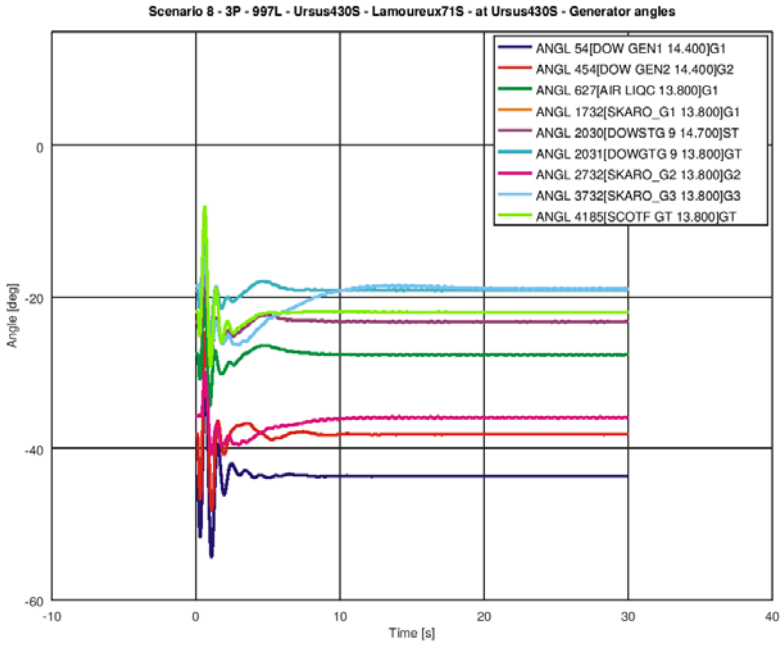


Figure A-959 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

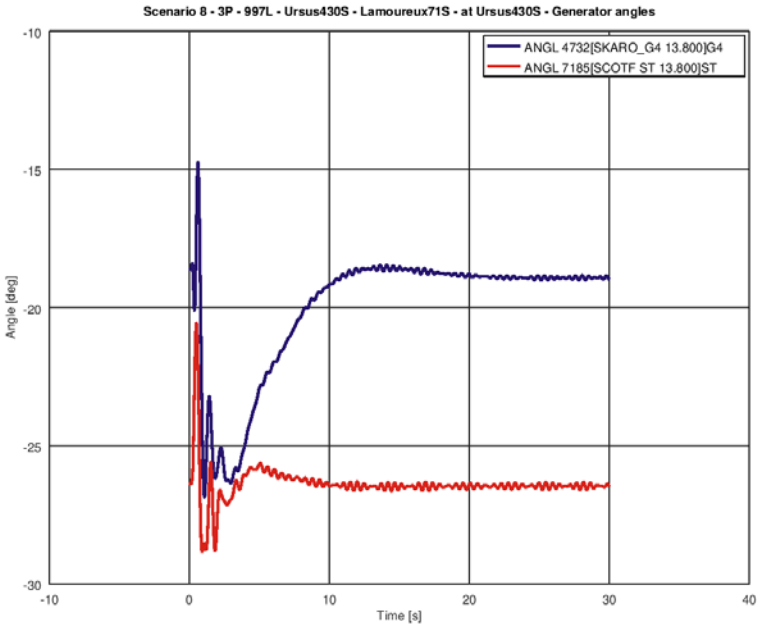


Figure A-960 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

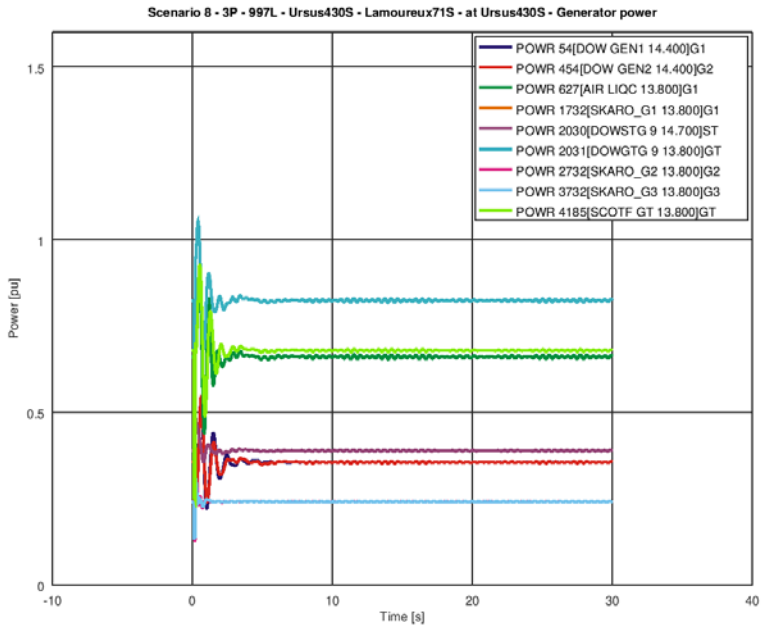


Figure A-961 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

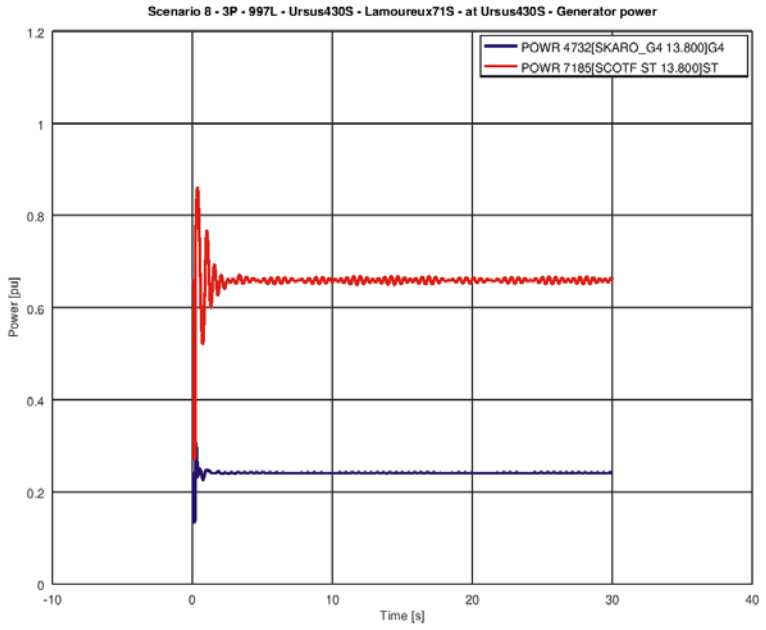


Figure A-962 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

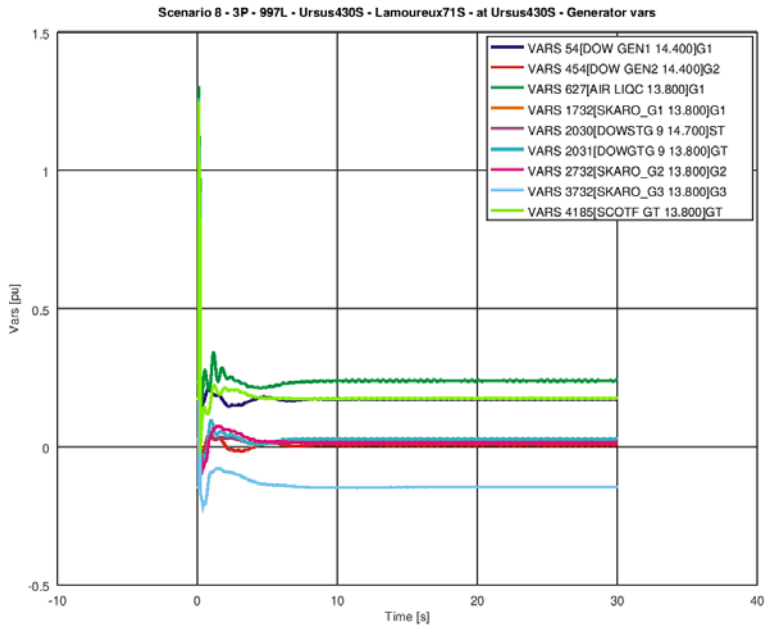


Figure A-963 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

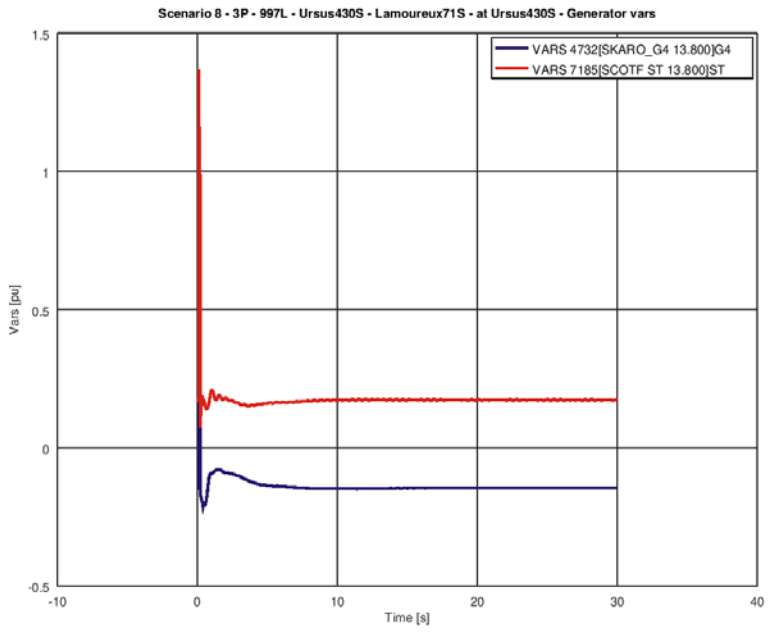


Figure A-964 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

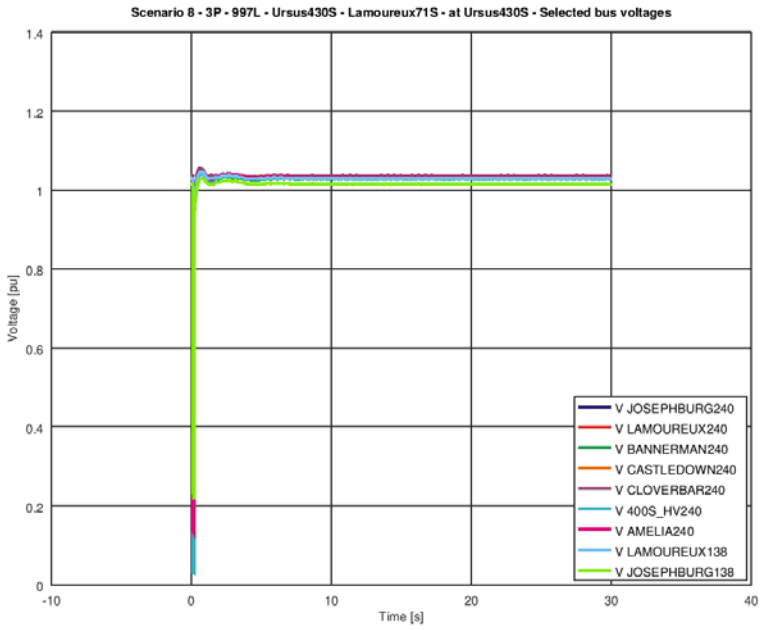


Figure A-965 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

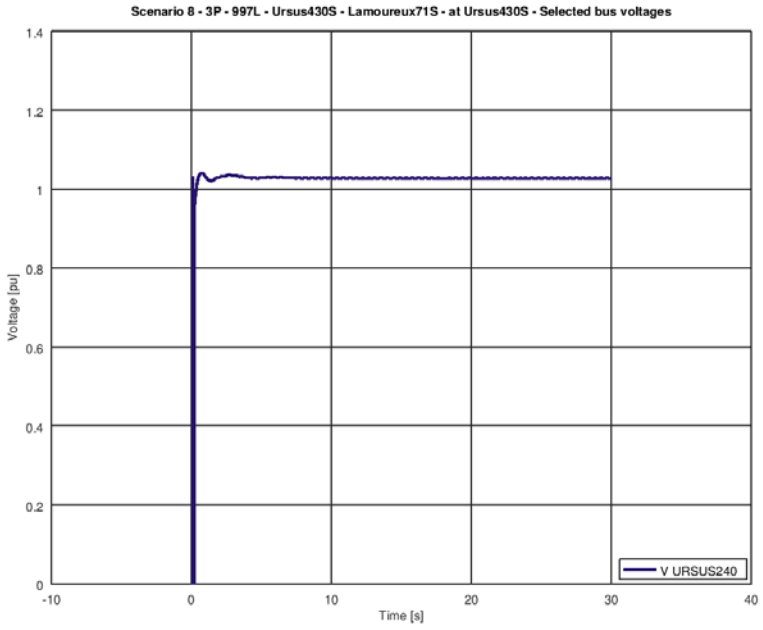


Figure A-966 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

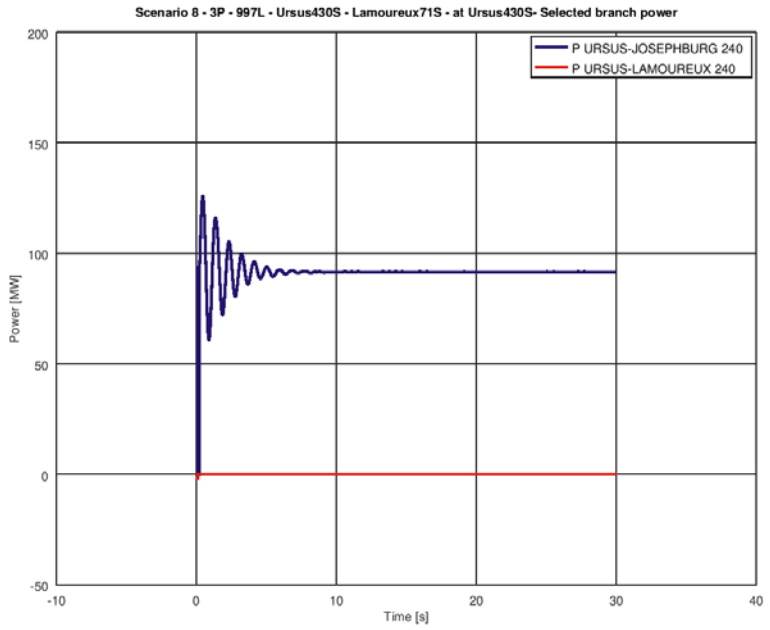


Figure A-967 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

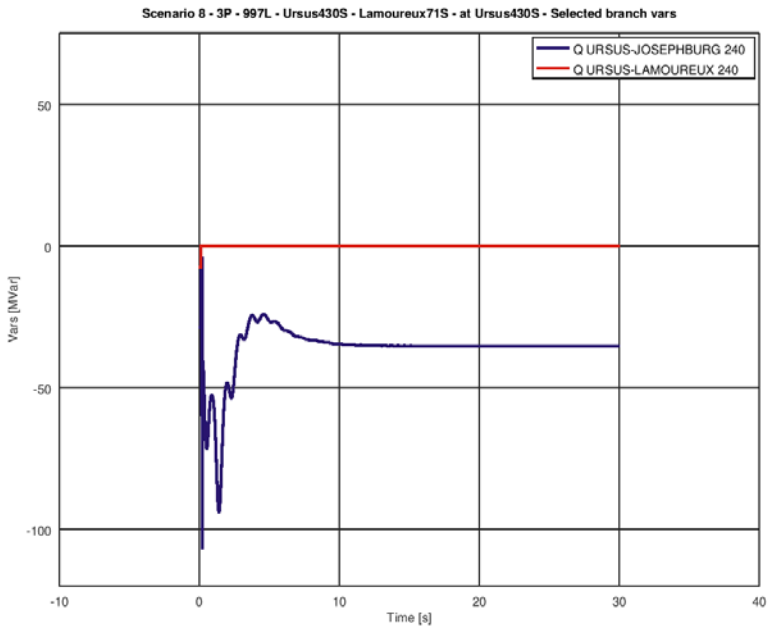


Figure A-968 Scenario 8 - 3P - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

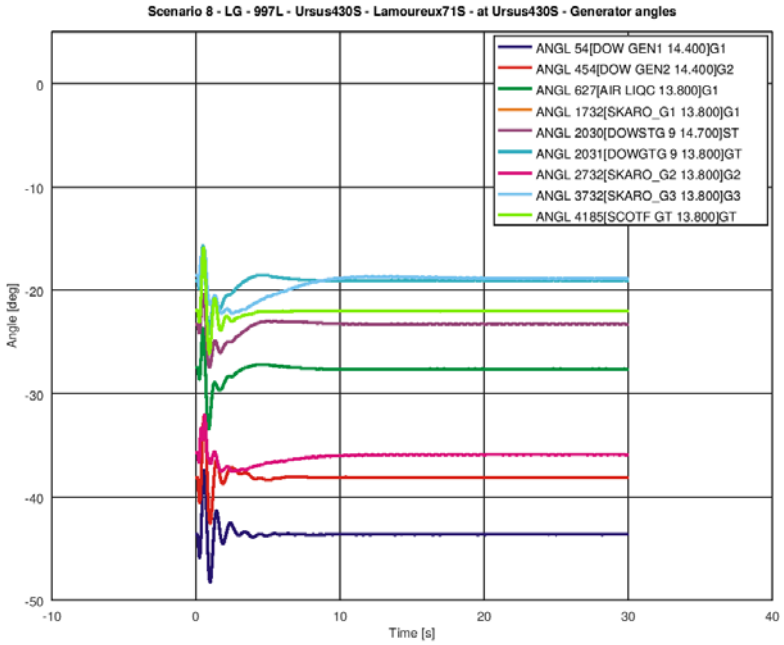


Figure A-969 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

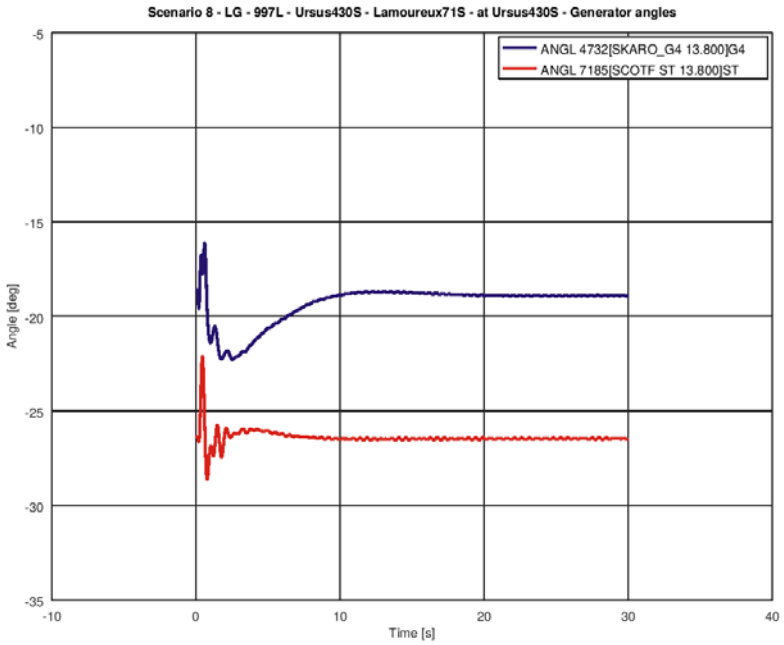


Figure A-970 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator angles

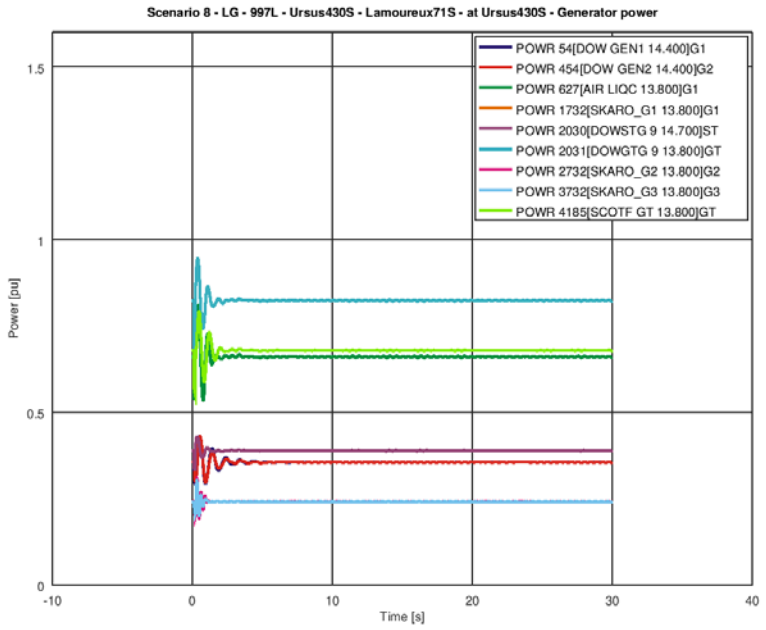


Figure A-971 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

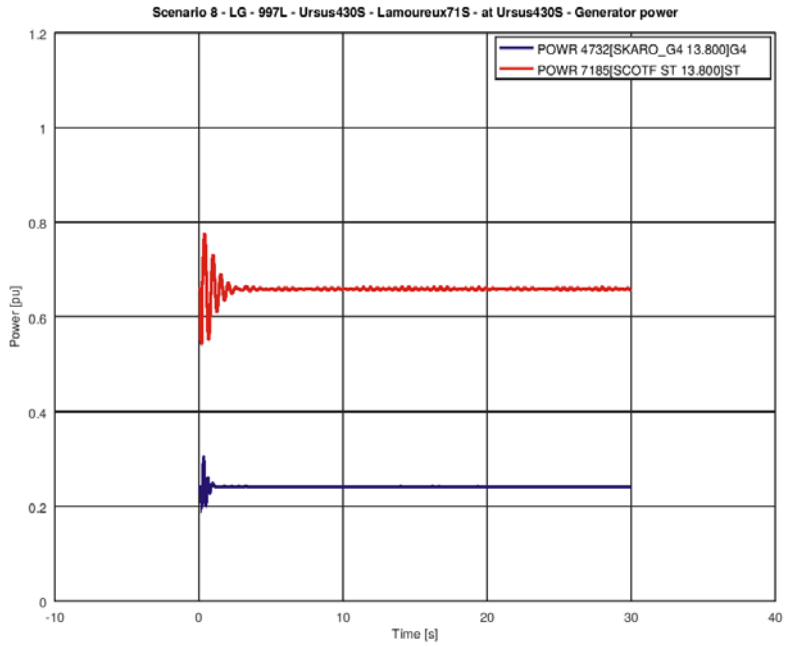


Figure A-972 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator power

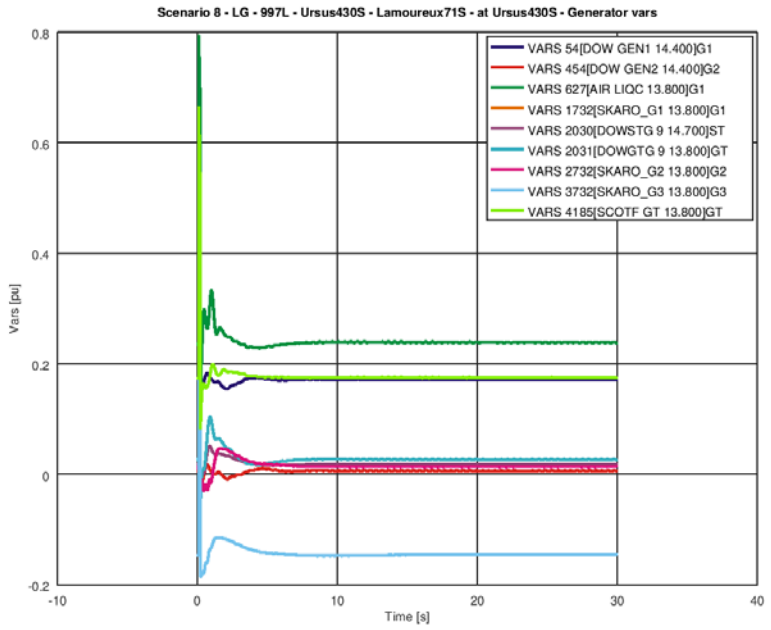


Figure A-973 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

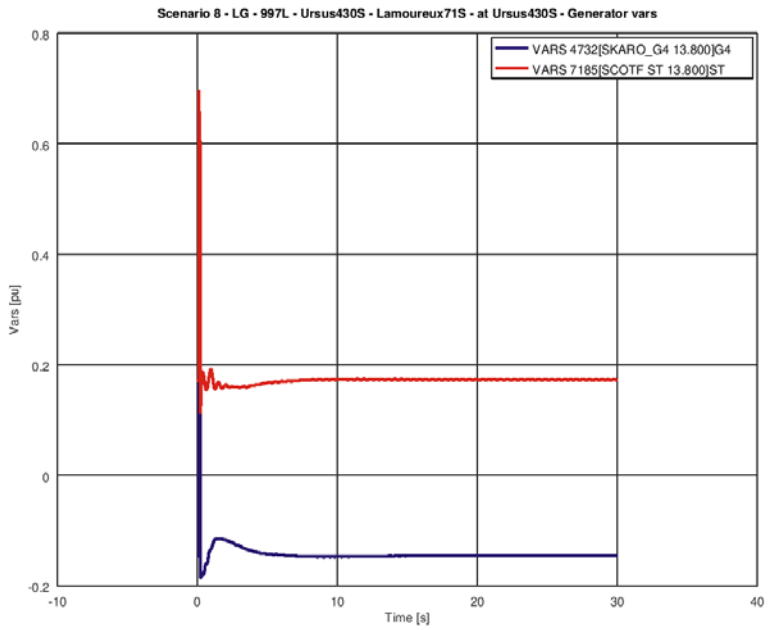


Figure A-974 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Generator vars

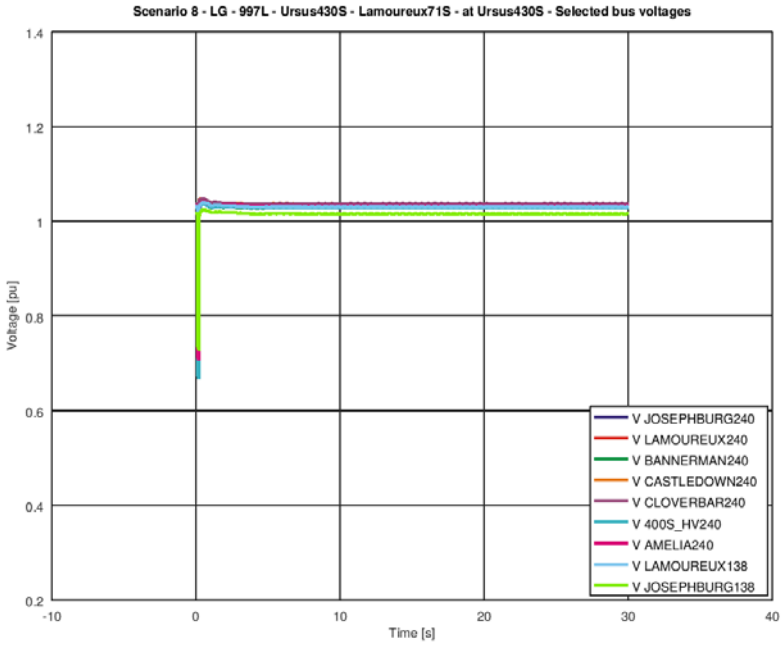


Figure A-975 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

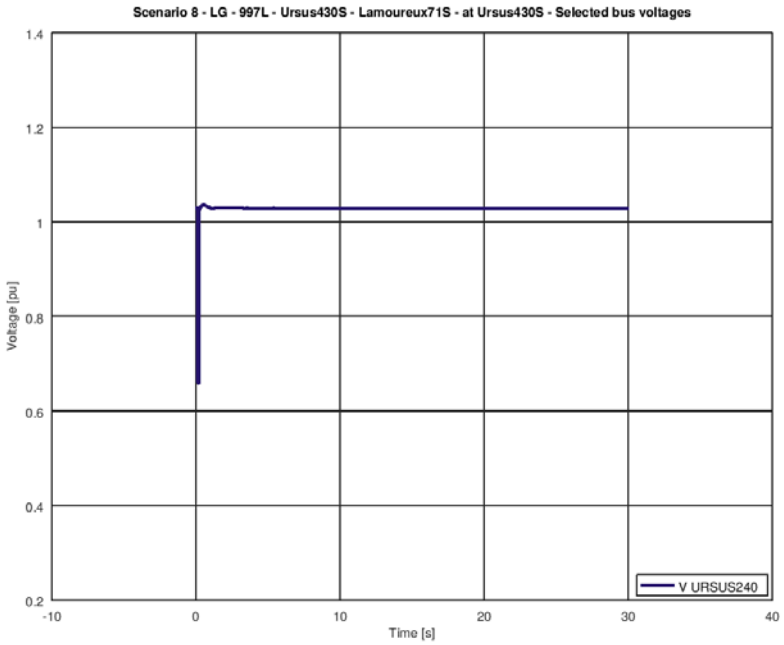


Figure A-976 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected bus voltages

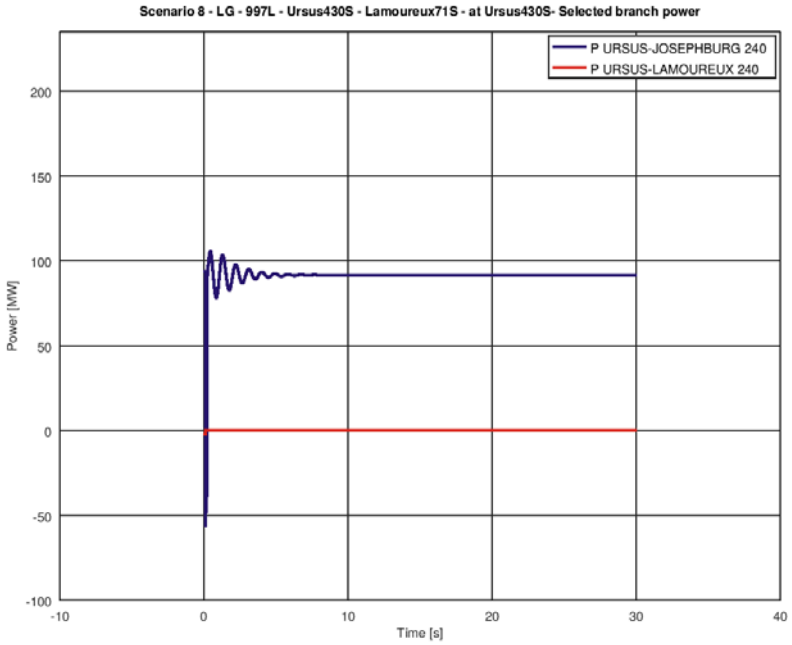


Figure A-977 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch power

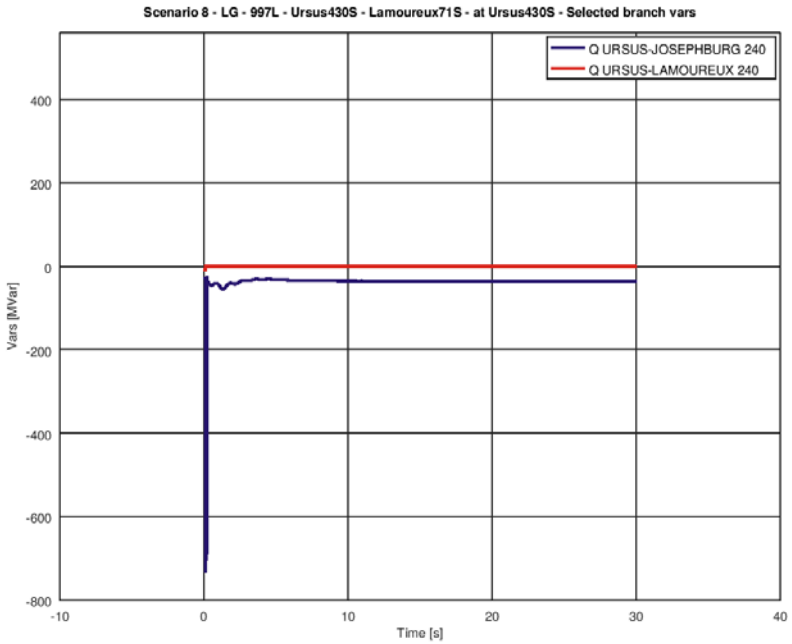


Figure A-978 Scenario 8 - LG - 997L - Ursus430S - Lamoureux71S - at Ursus430S - Selected branch vars

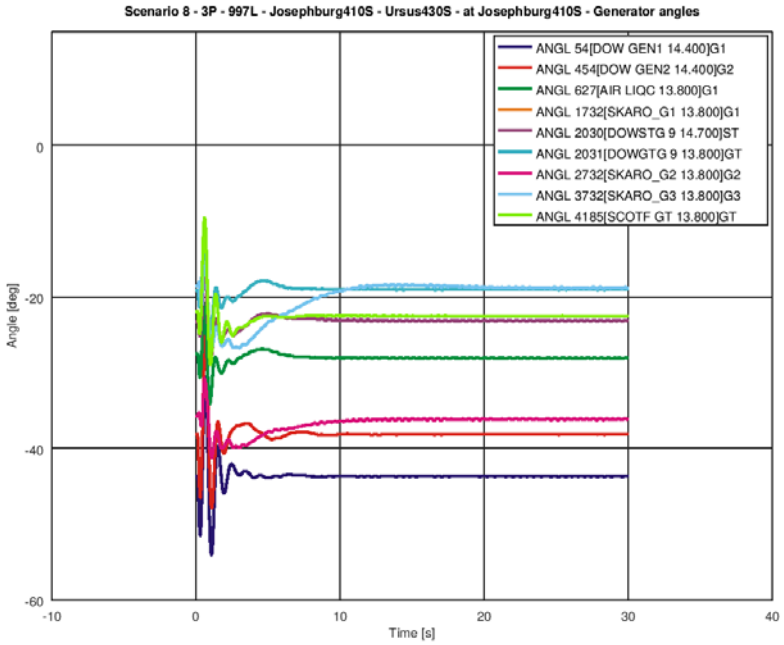


Figure A-979 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

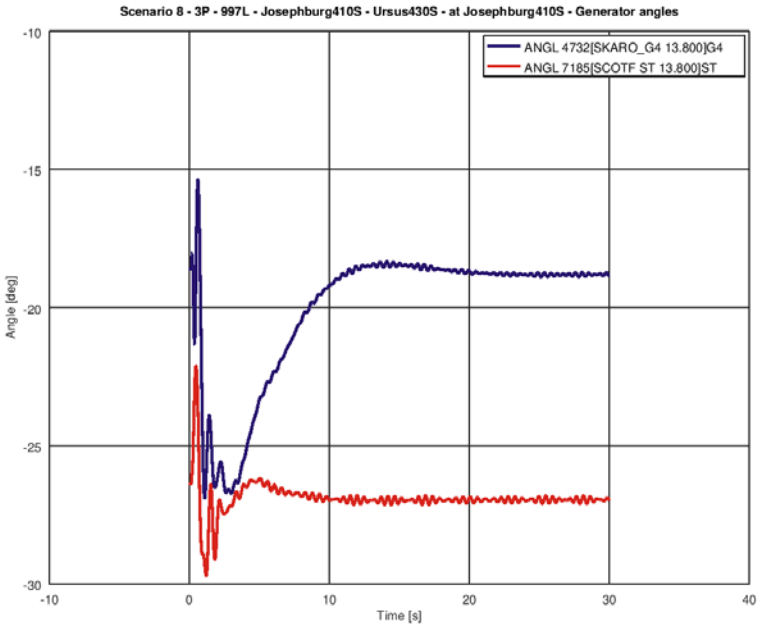


Figure A-980 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

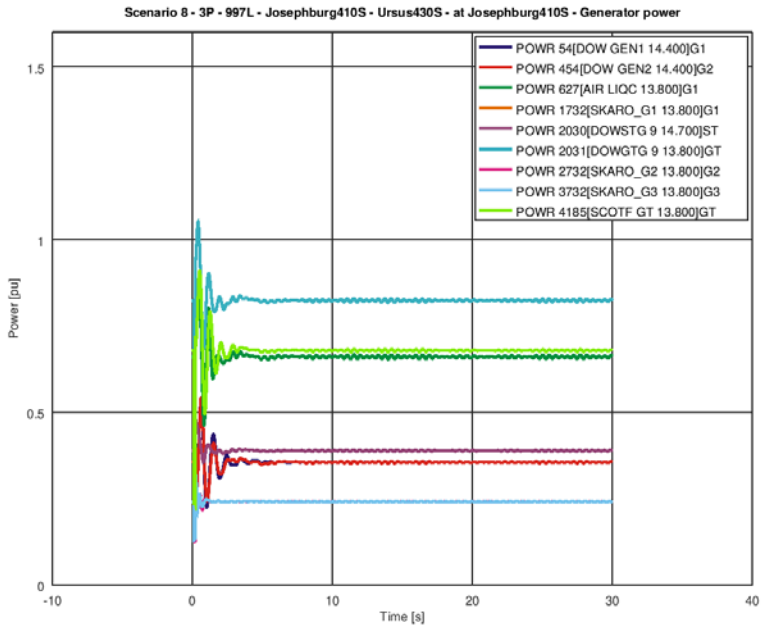


Figure A-981 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

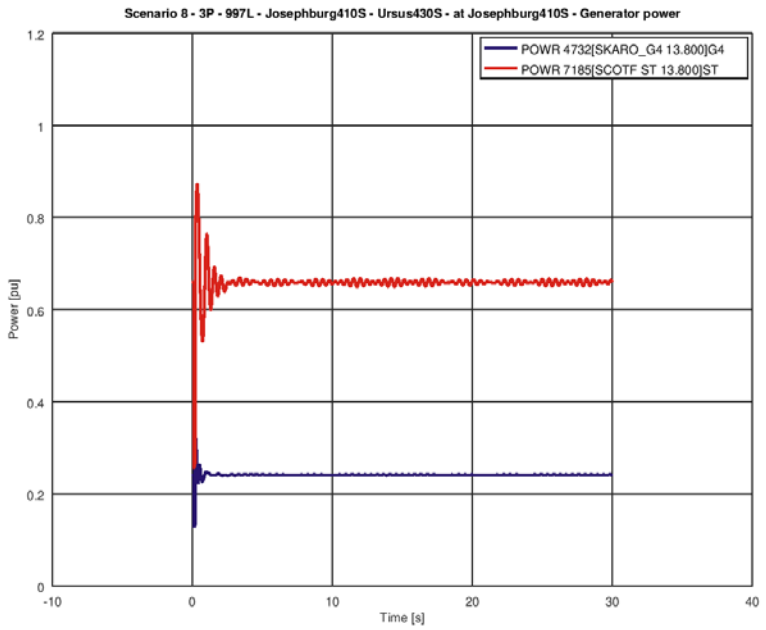


Figure A-982 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

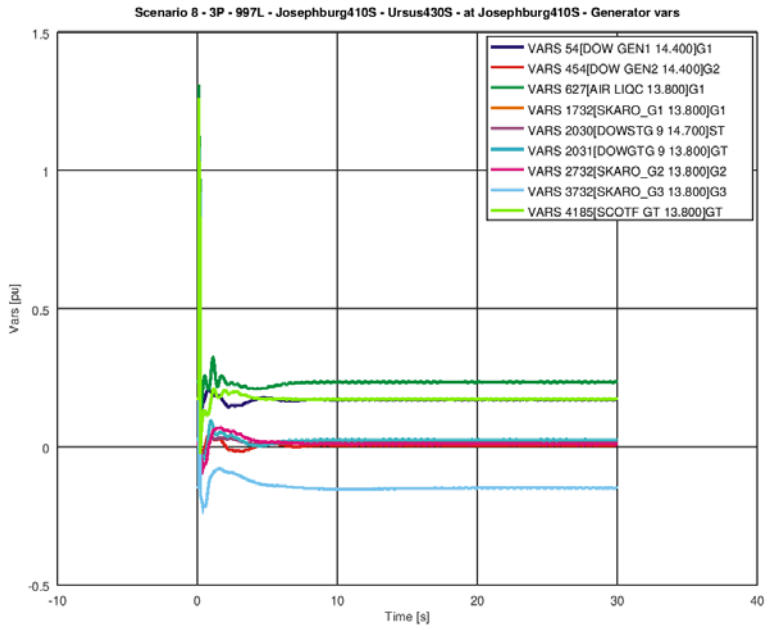


Figure A-983 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

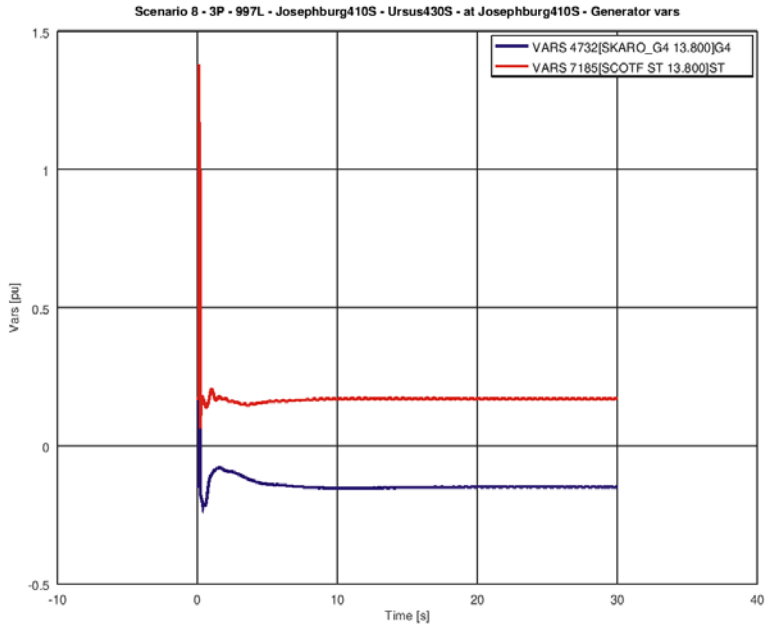


Figure A-984 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

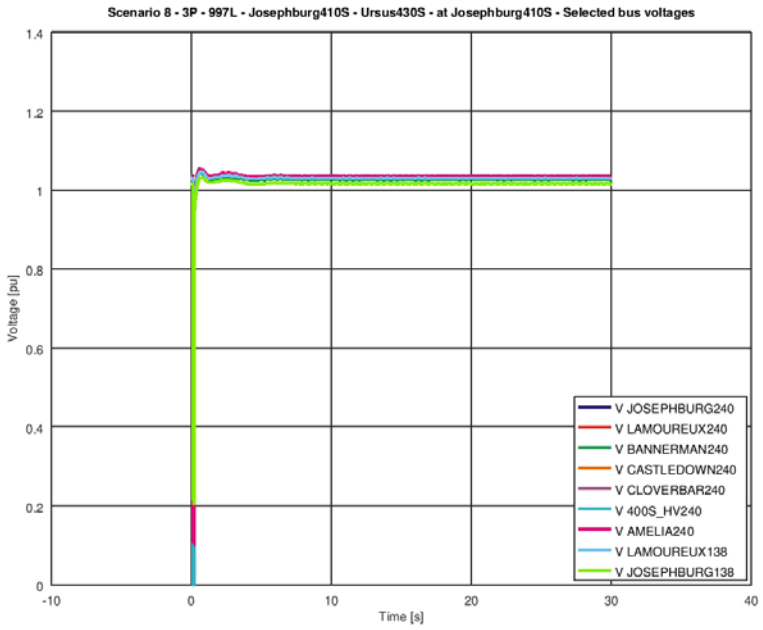


Figure A-985 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

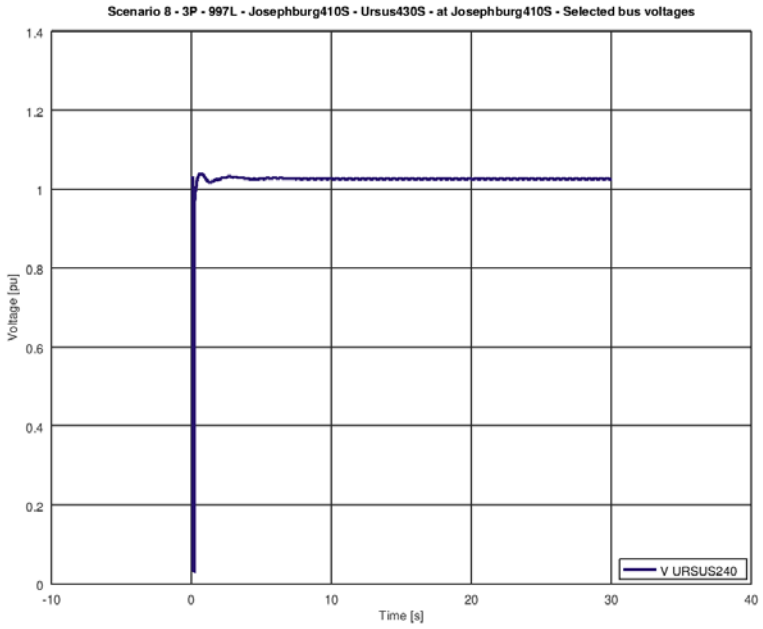


Figure A-986 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

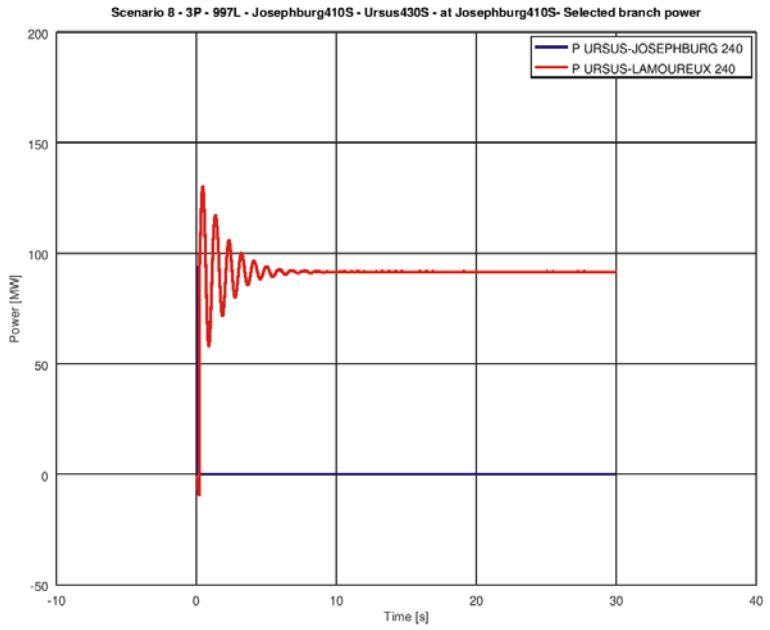


Figure A-987 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

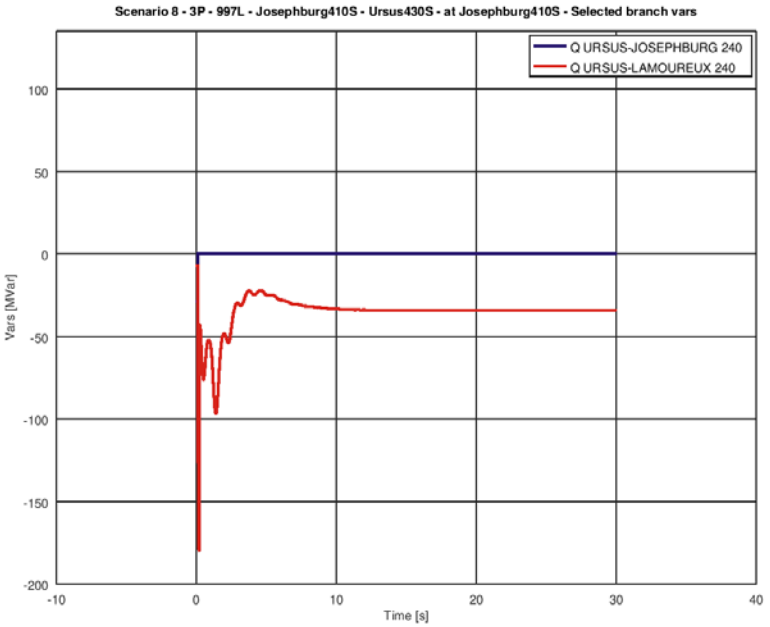


Figure A-988 Scenario 8 - 3P - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

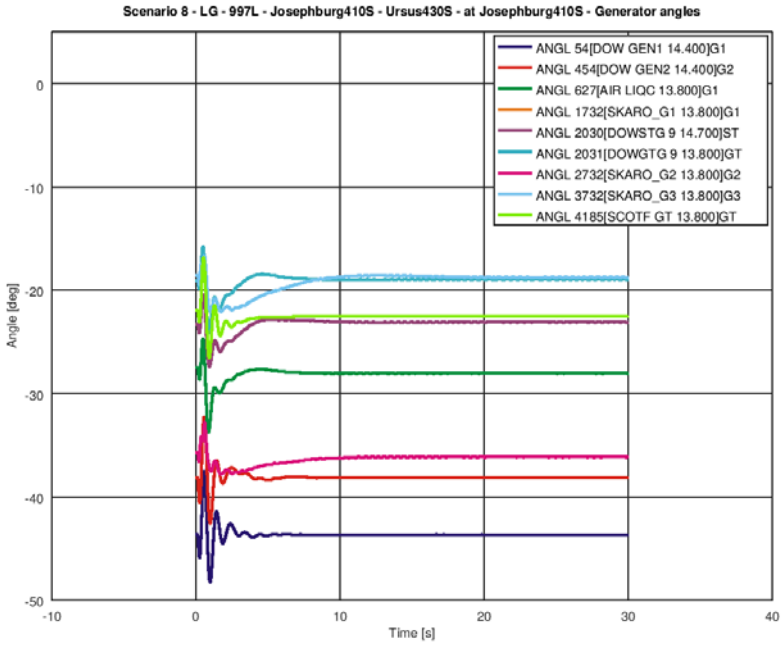


Figure A-989 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

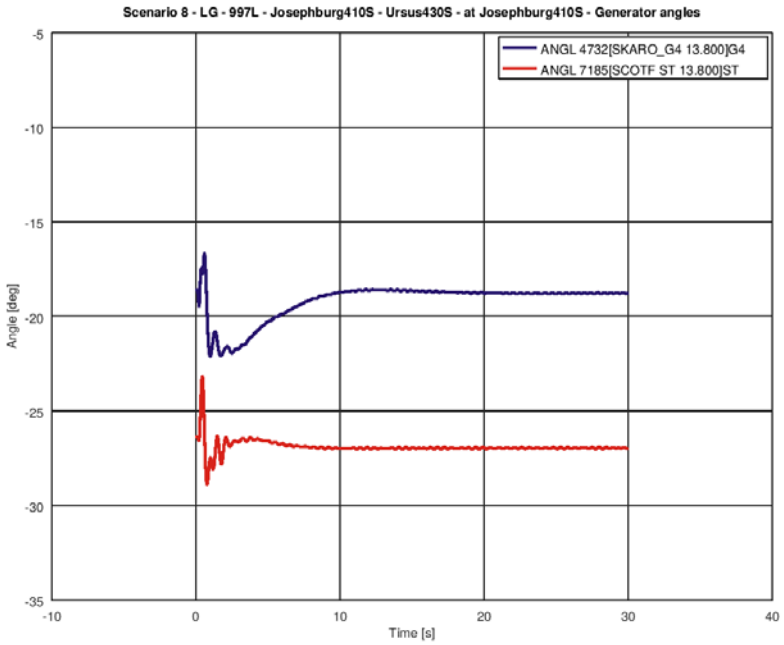


Figure A-990 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator angles

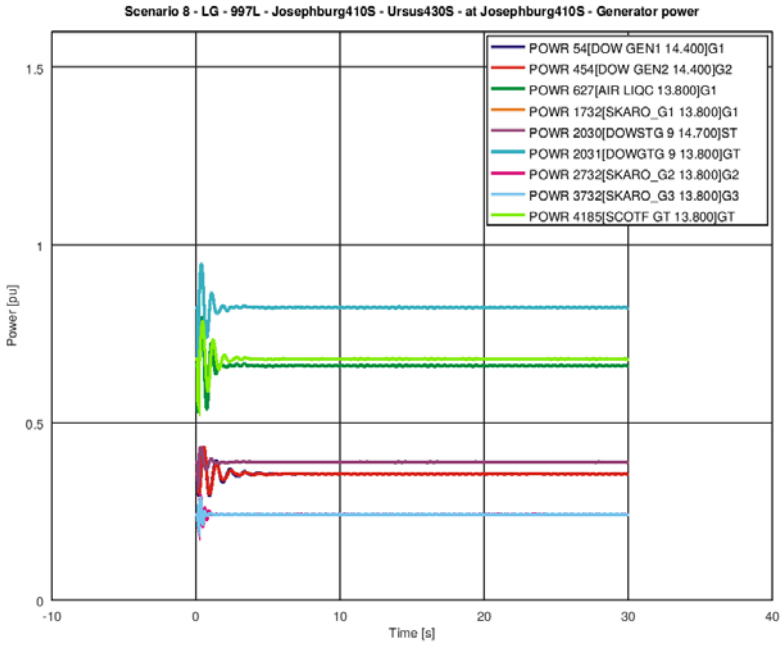


Figure A-991 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

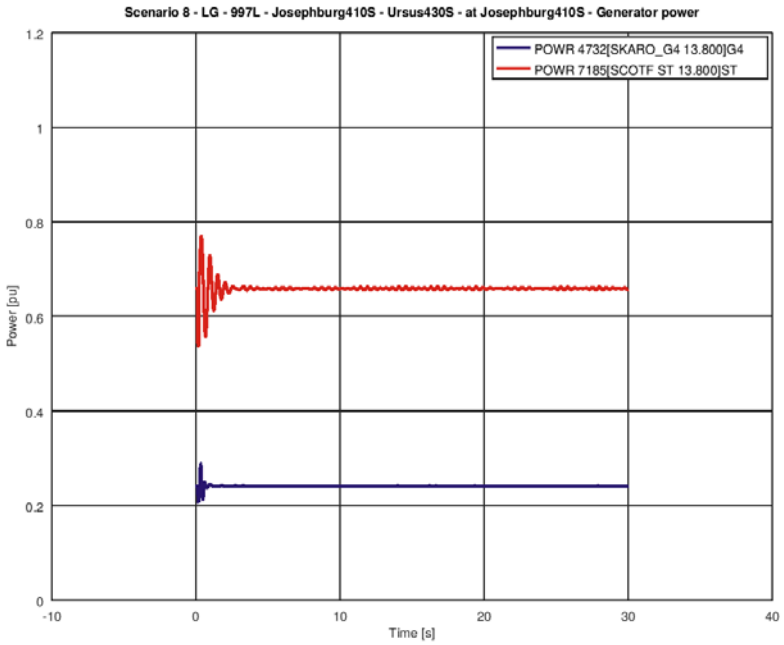


Figure A-992 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator power

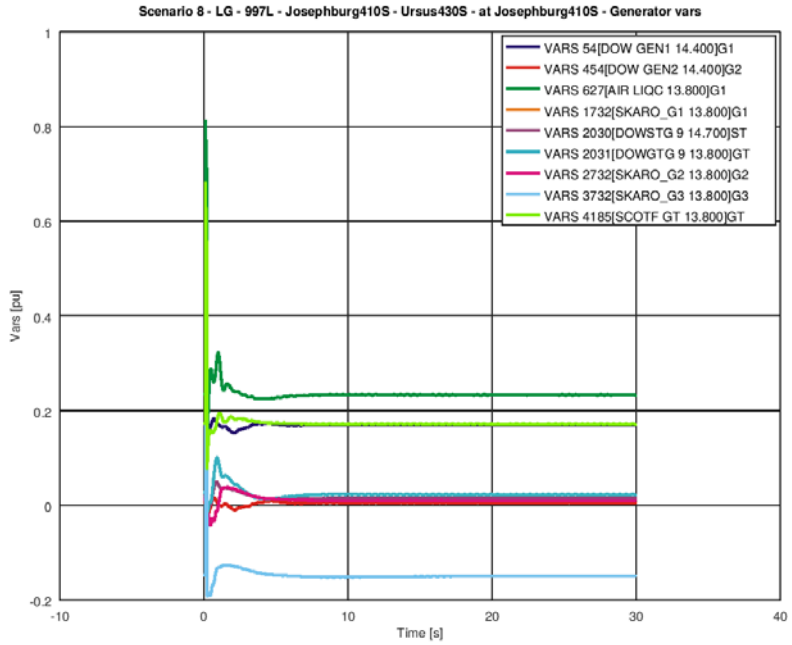


Figure A-993 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

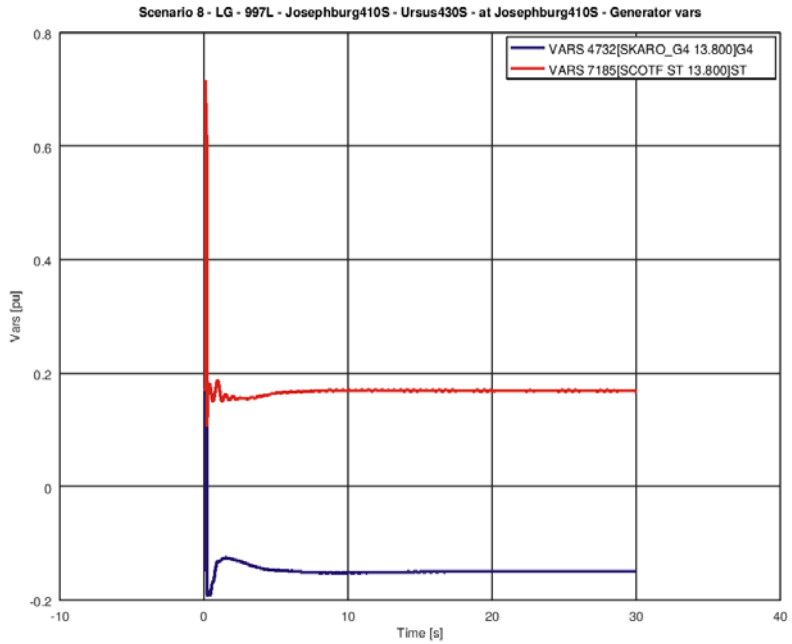


Figure A-994 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Generator vars

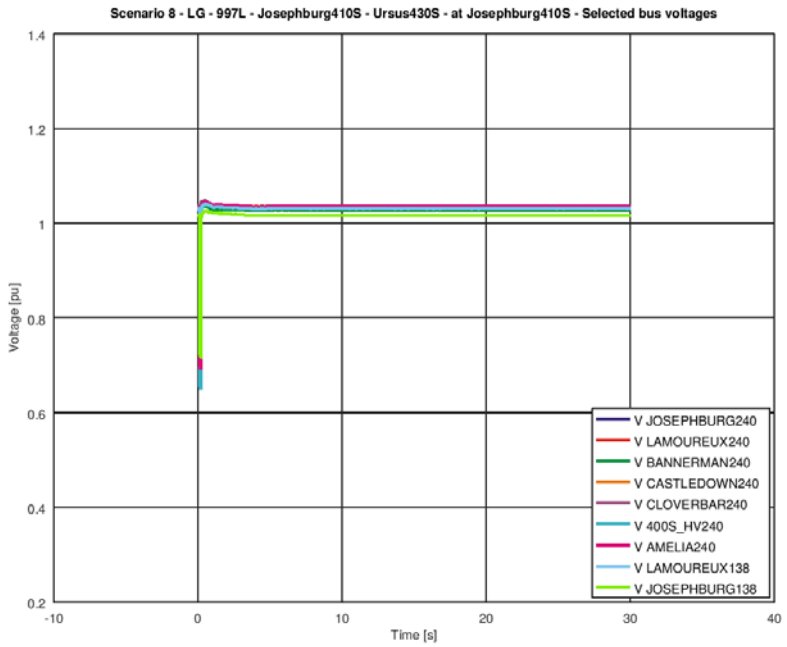


Figure A-995 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

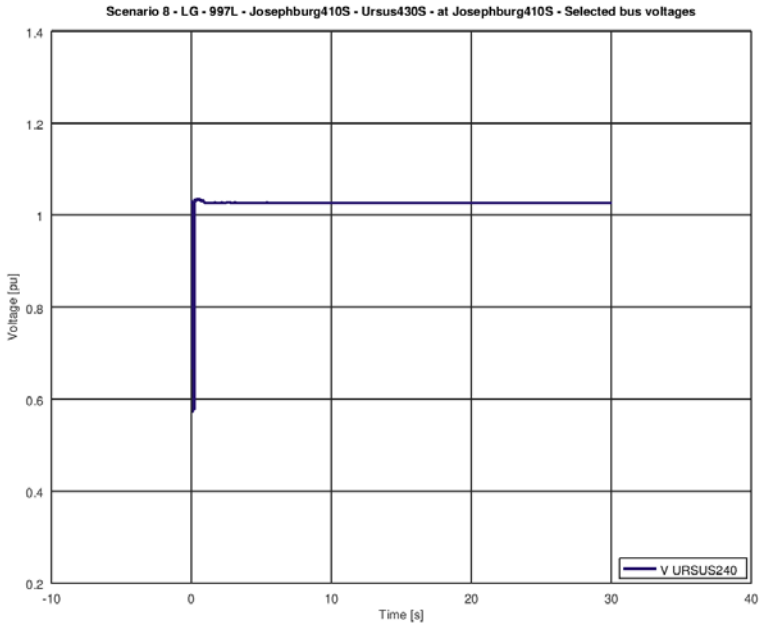


Figure A-996 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected bus voltages

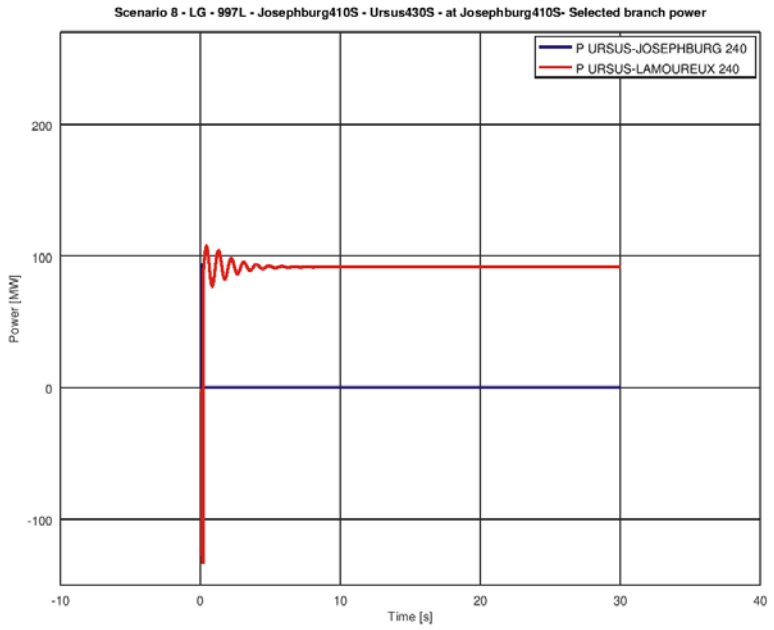


Figure A-997 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch power

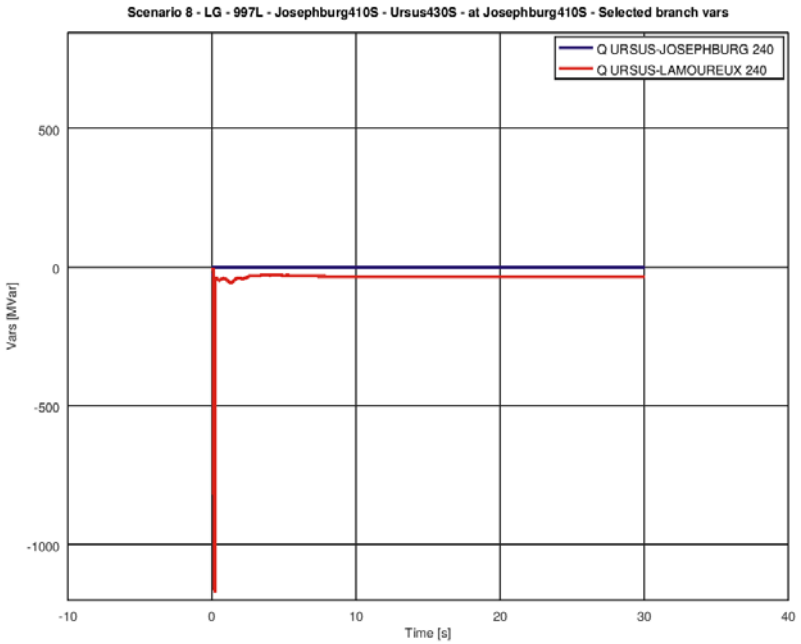


Figure A-998 Scenario 8 - LG - 997L - Josephburg410S - Ursus430S - at Josephburg410S - Selected branch vars

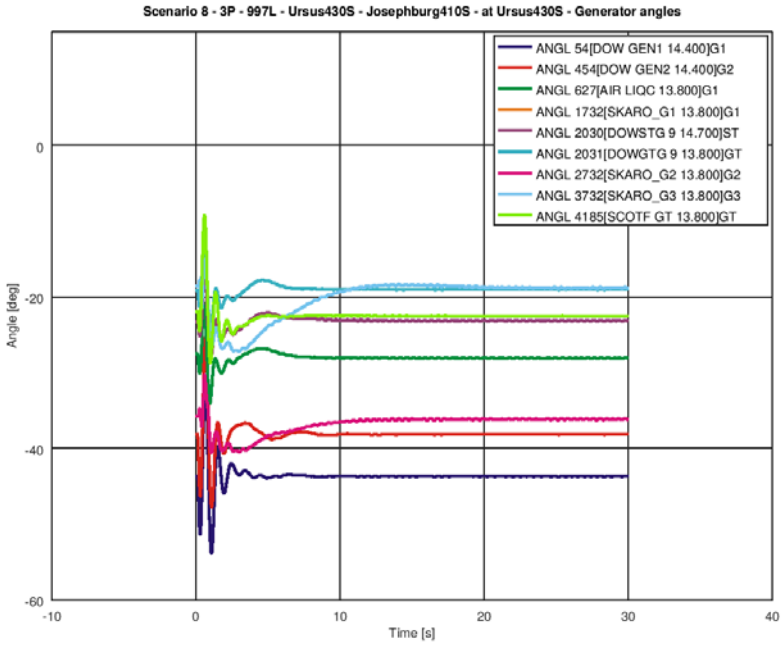


Figure A-999 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

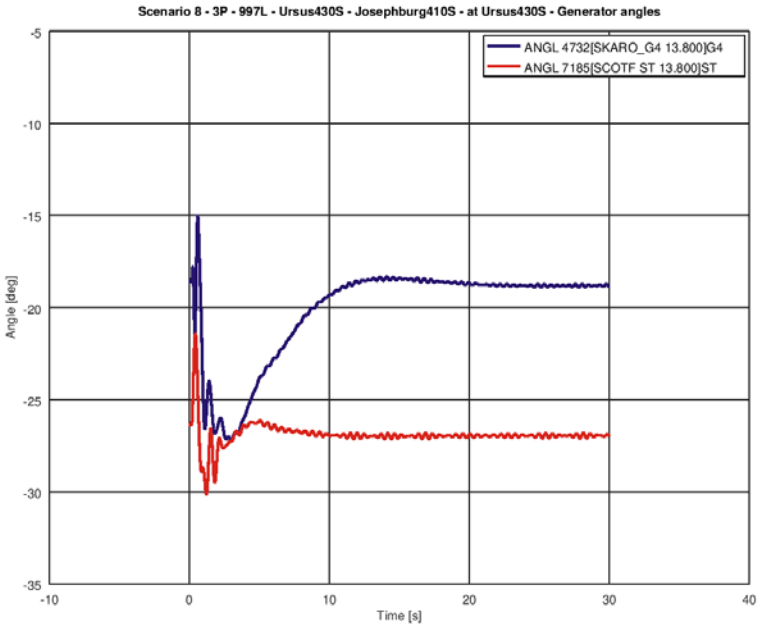


Figure A-1000 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

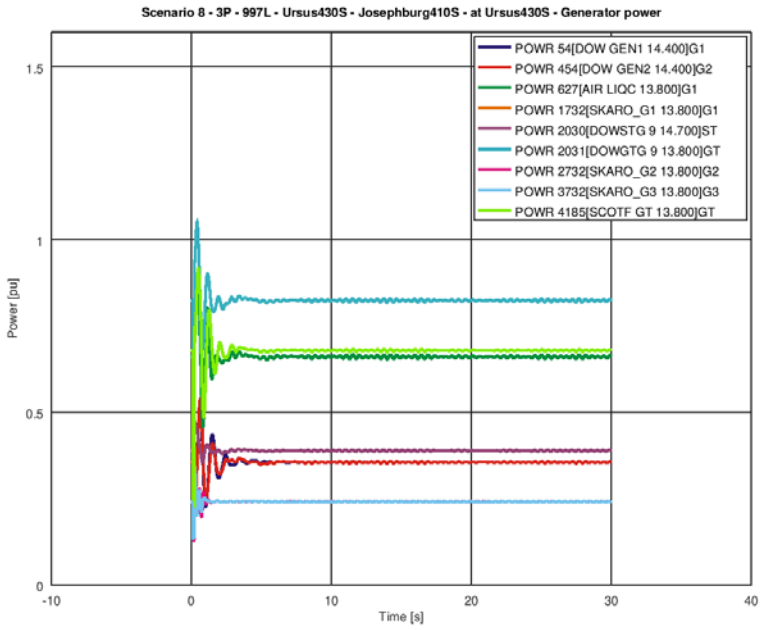


Figure A-1001 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

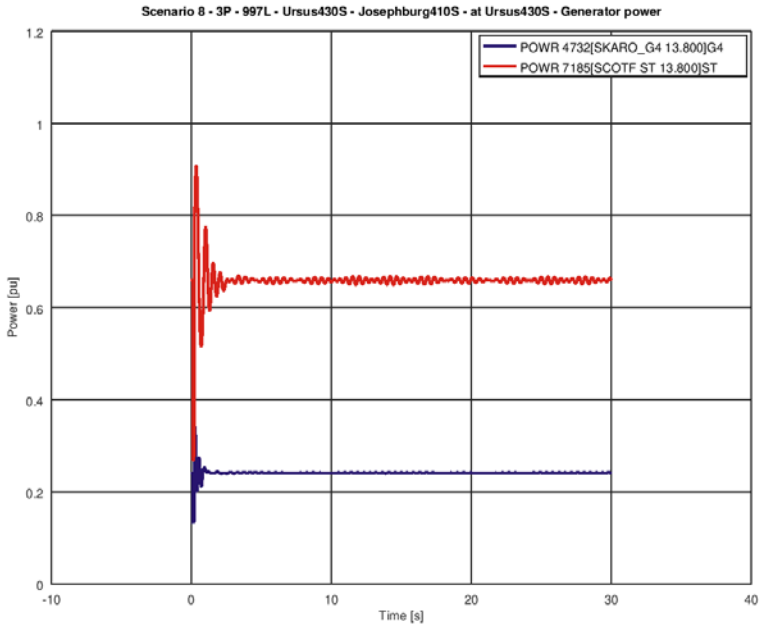


Figure A-1002 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

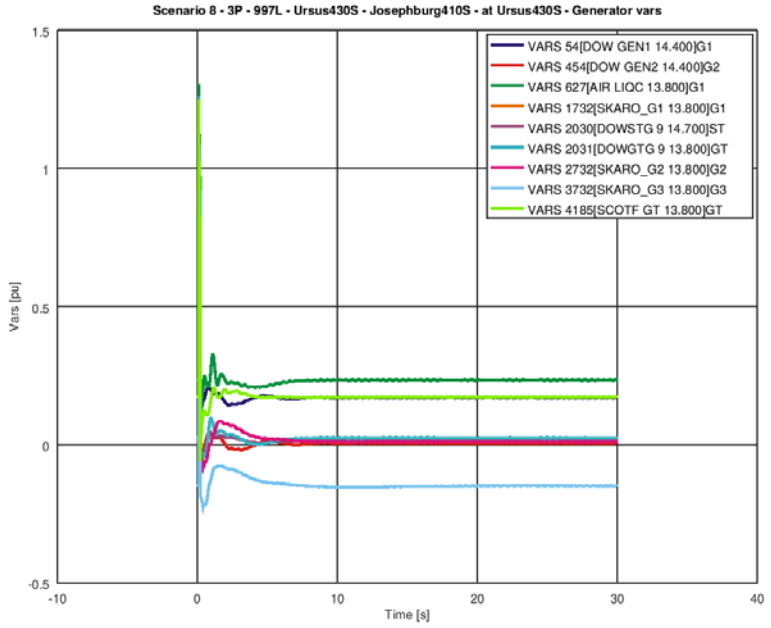


Figure A-1003 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

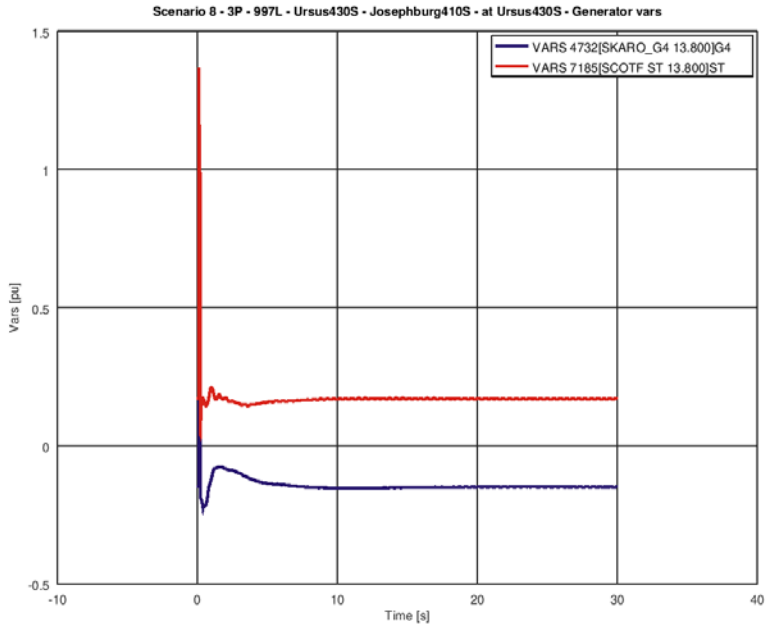


Figure A-1004 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

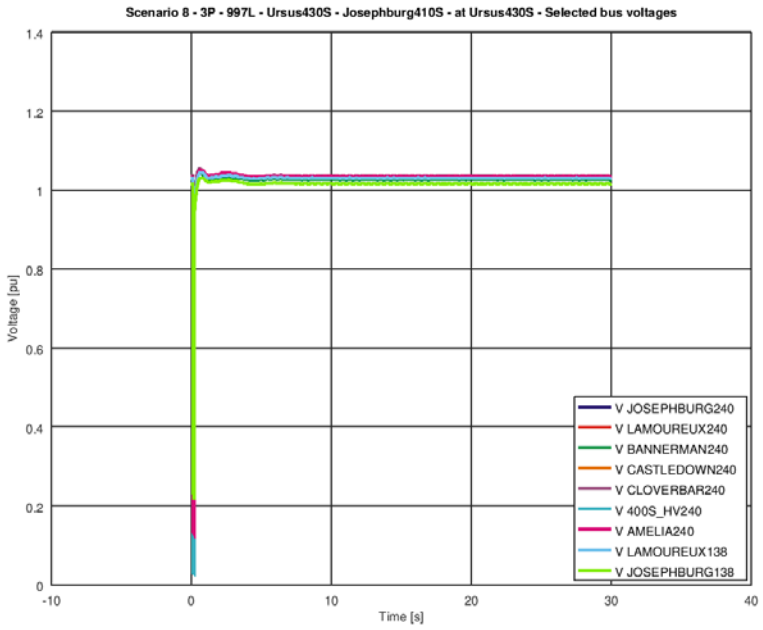


Figure A-1005 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

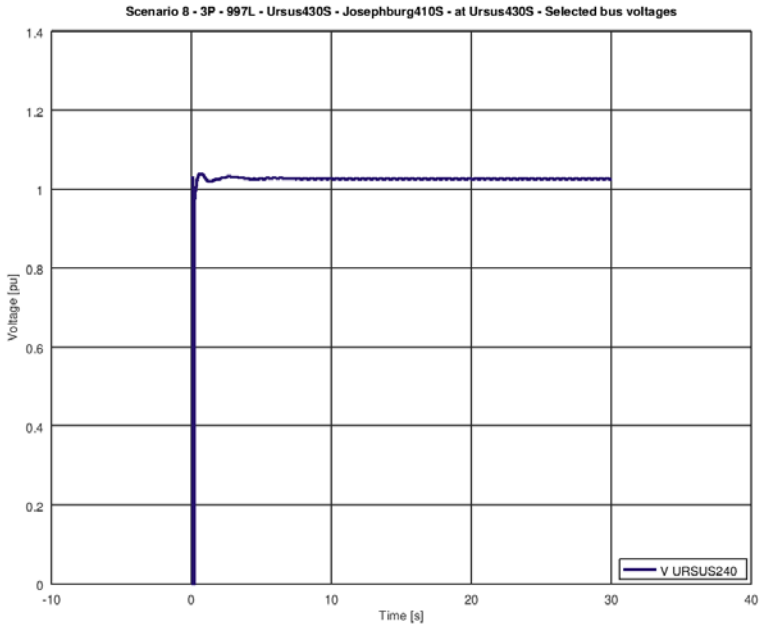


Figure A-1006 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

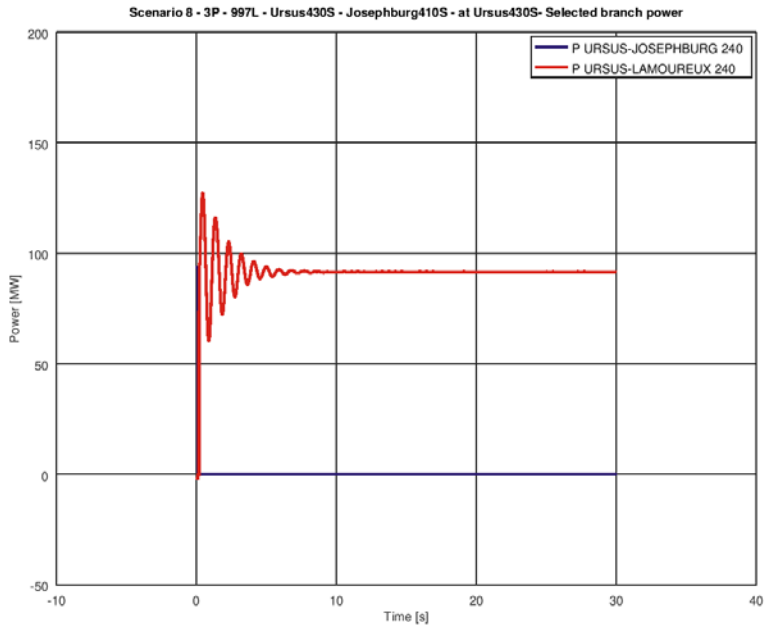


Figure A-1007 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch power

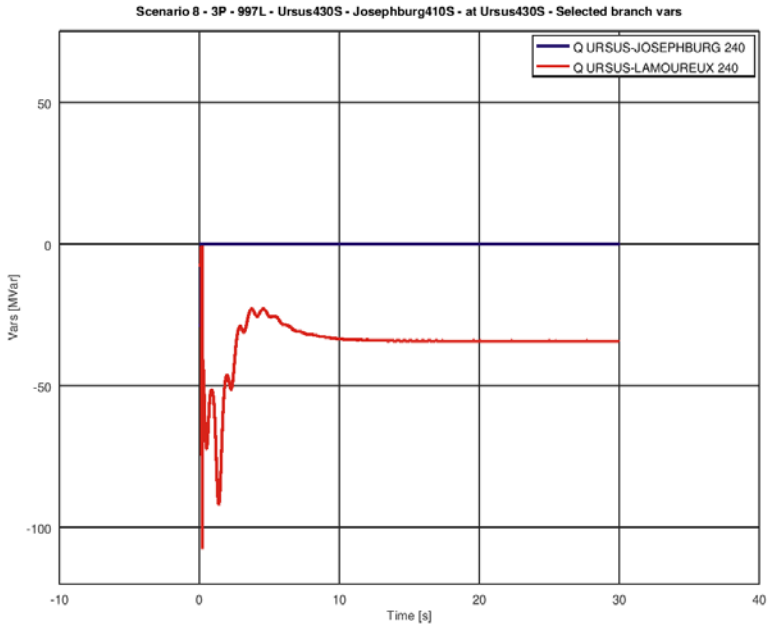


Figure A-1008 Scenario 8 - 3P - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch vars

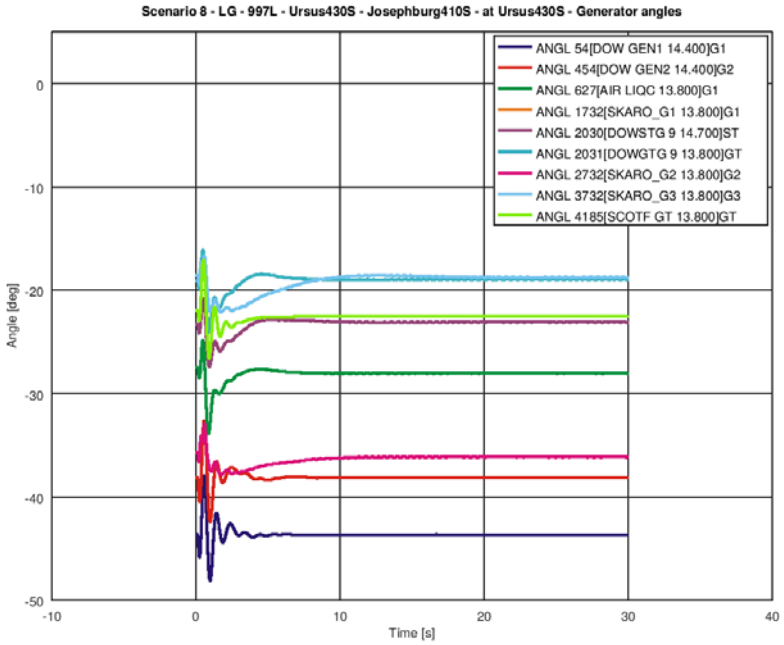


Figure A-1009 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

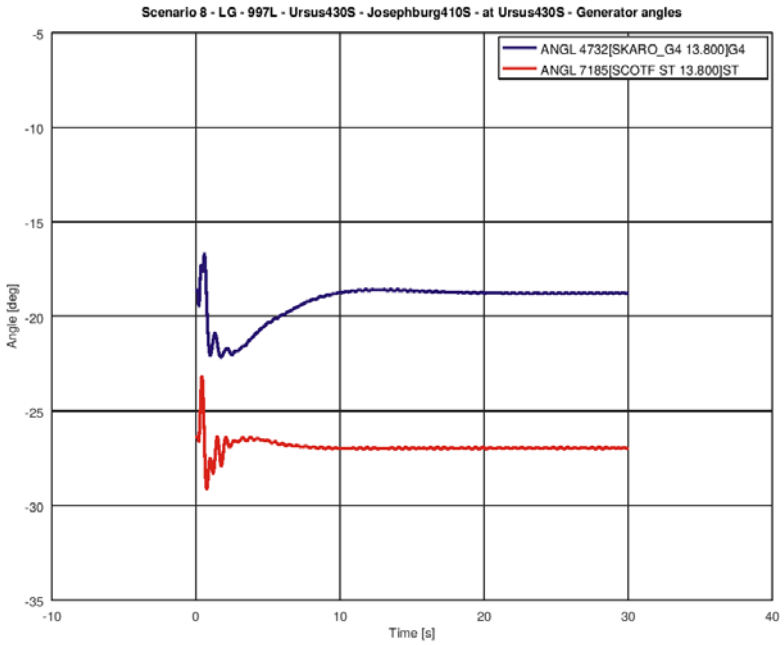


Figure A-1010 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator angles

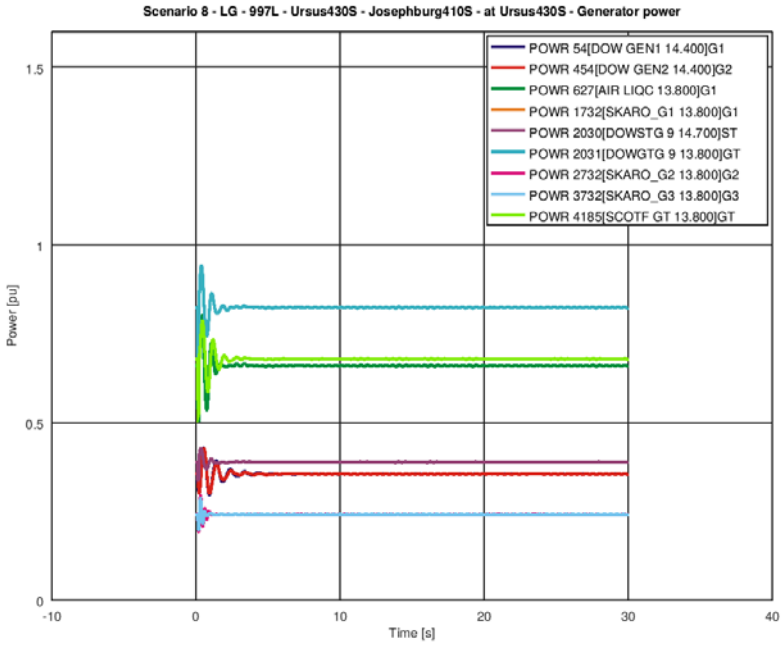


Figure A-1011 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

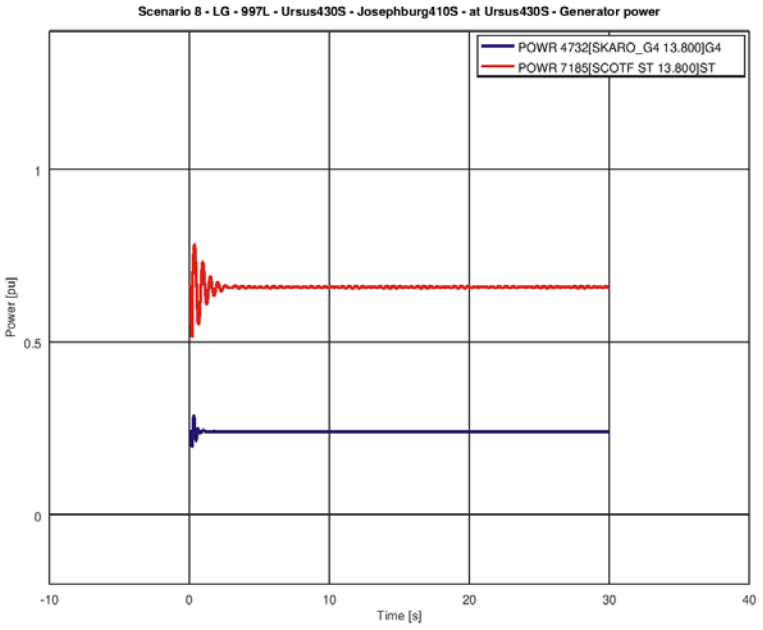


Figure A-1012 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator power

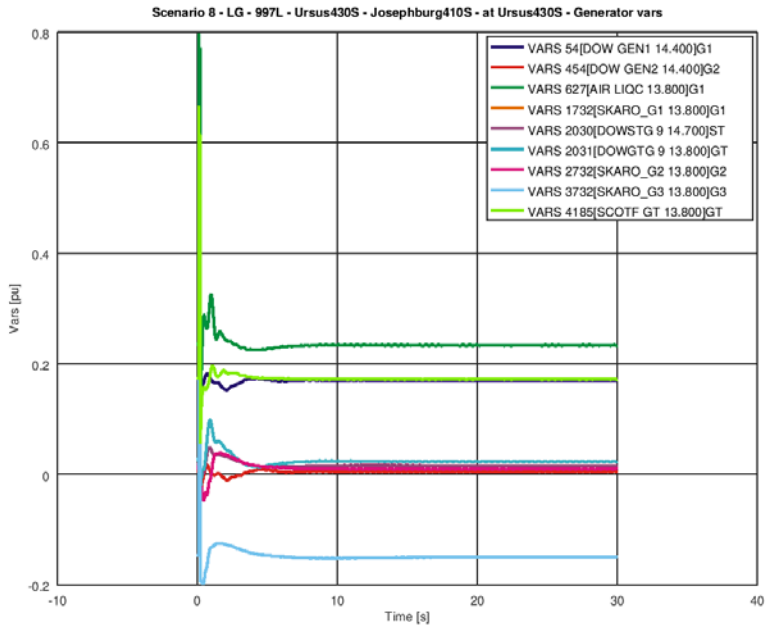


Figure A-1013 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

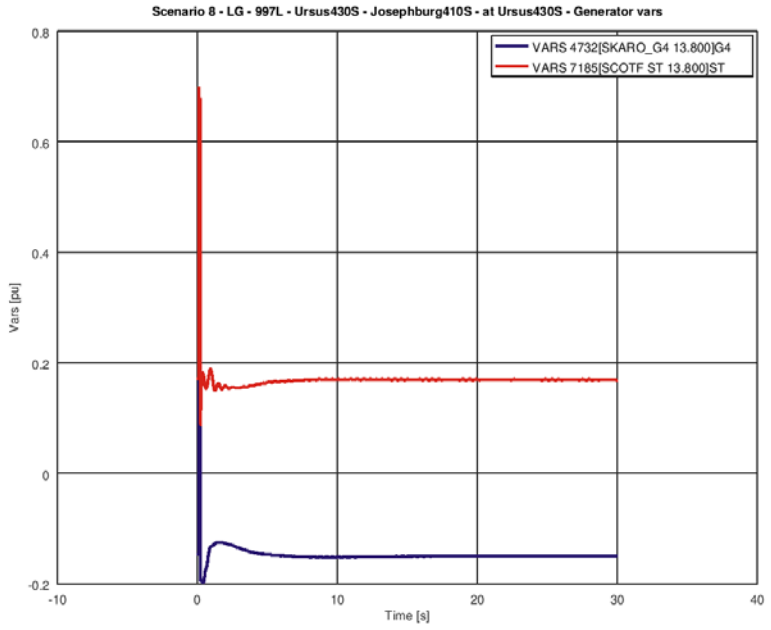


Figure A-1014 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Generator vars

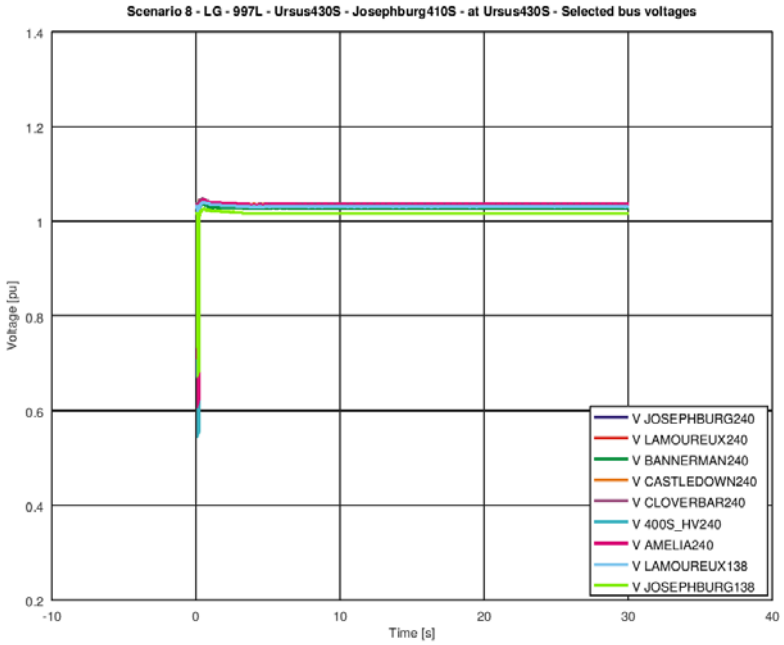


Figure A-1015 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

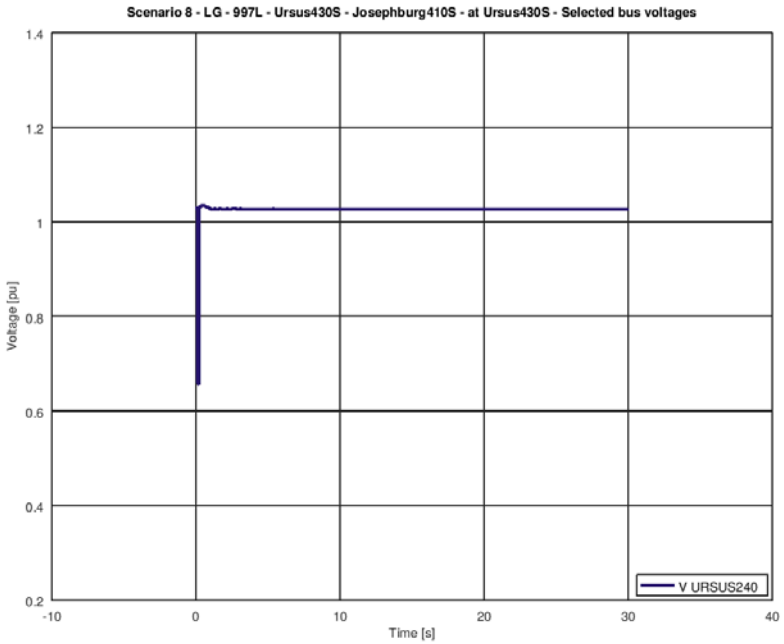


Figure A-1016 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected bus voltages

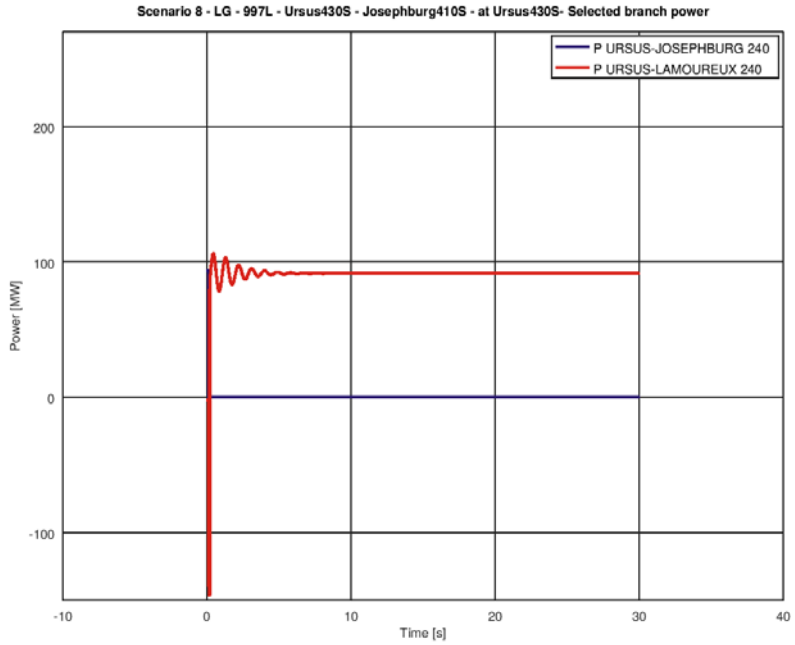


Figure A-1017 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch power

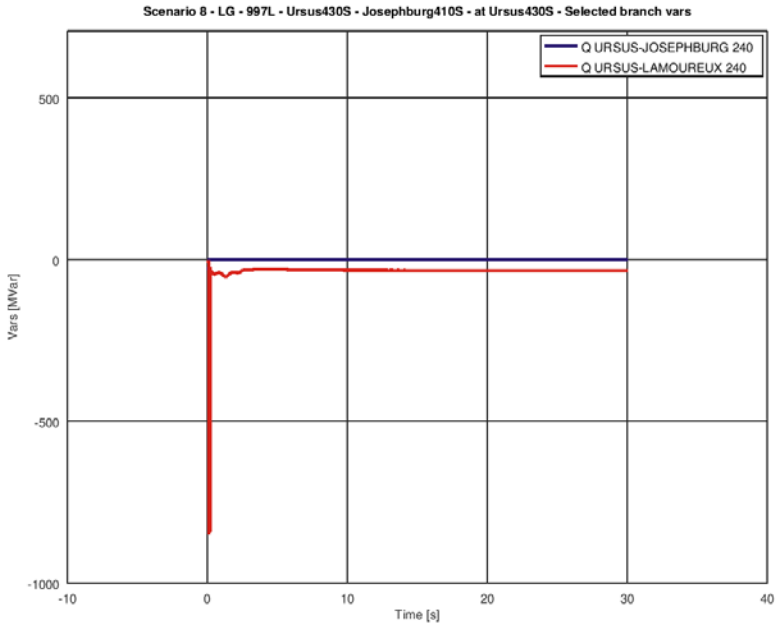


Figure A-1018 Scenario 8 - LG - 997L - Ursus430S - Josephburg410S - at Ursus430S - Selected branch vars

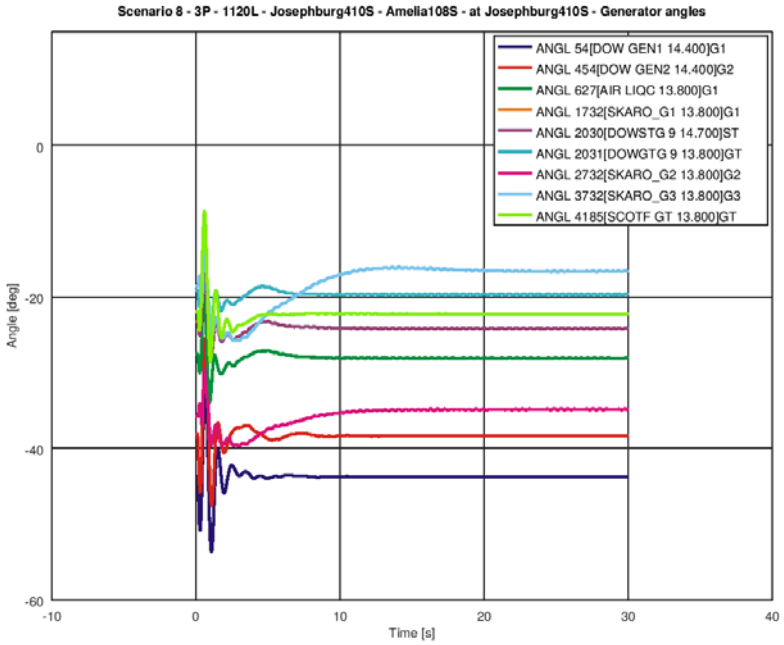


Figure A-1019 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

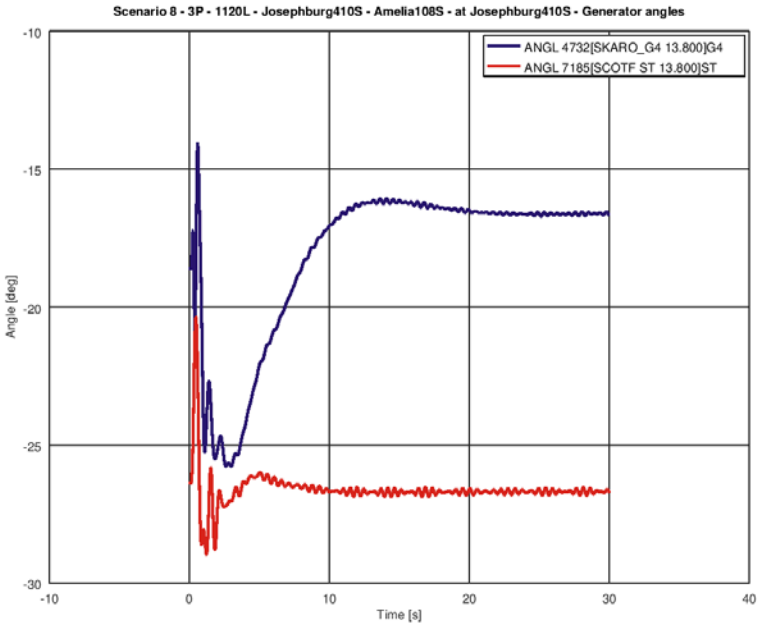


Figure A-1020 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

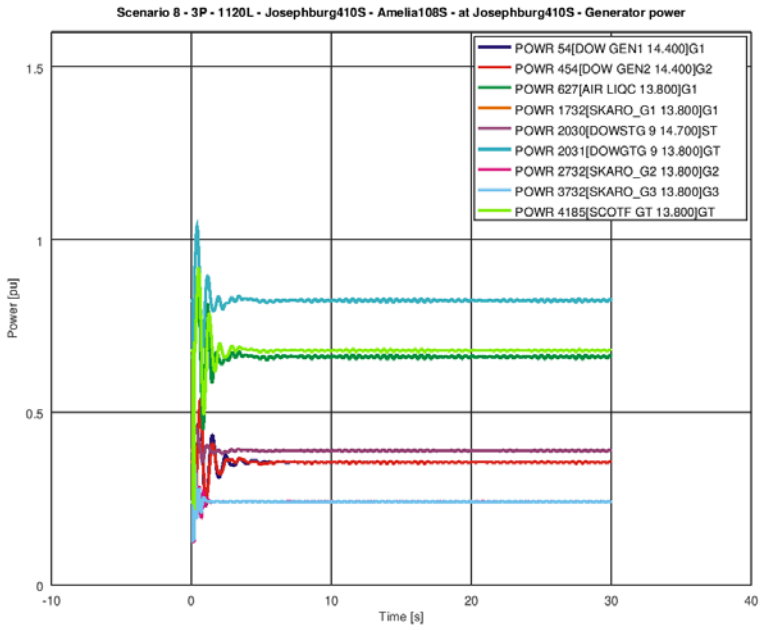


Figure A-1021 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

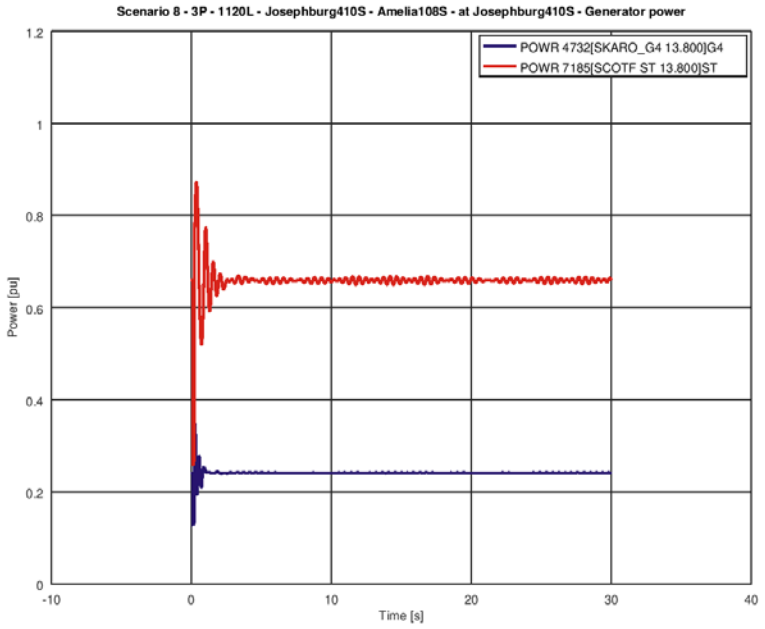


Figure A-1022 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

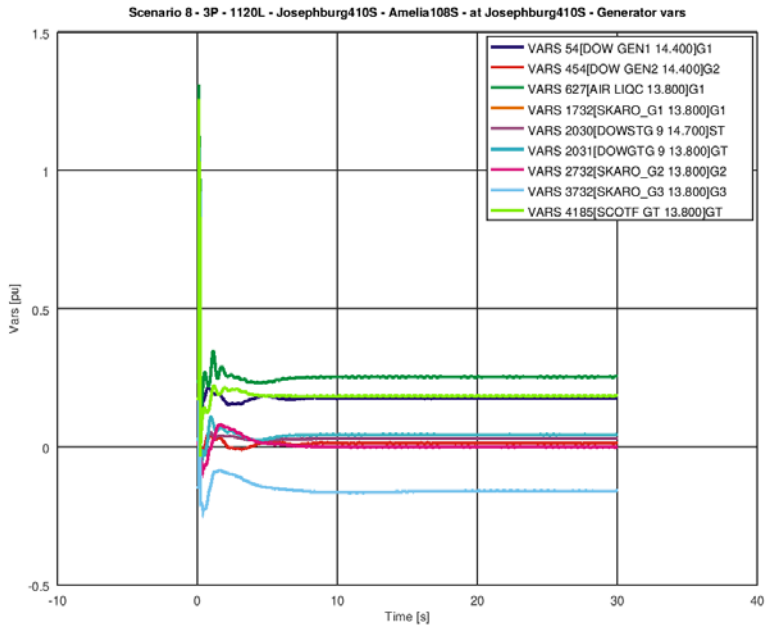


Figure A-1023 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

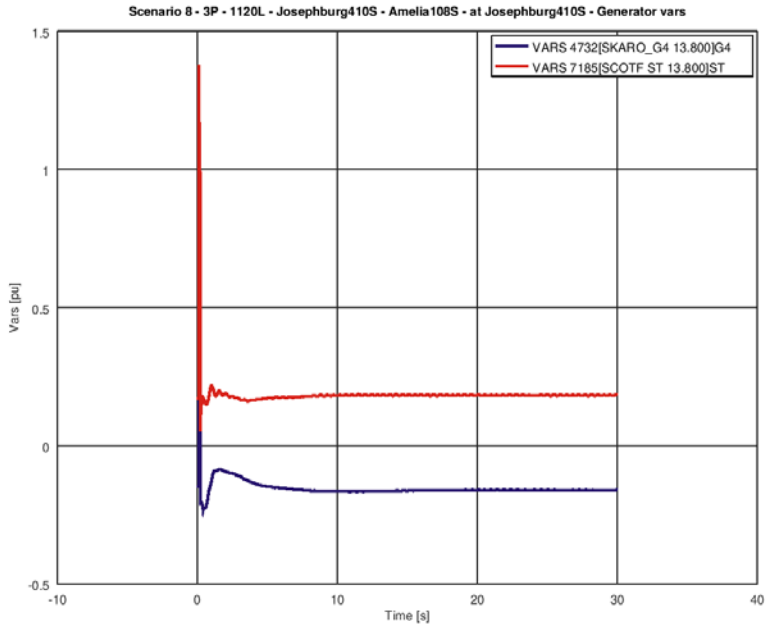


Figure A-1024 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

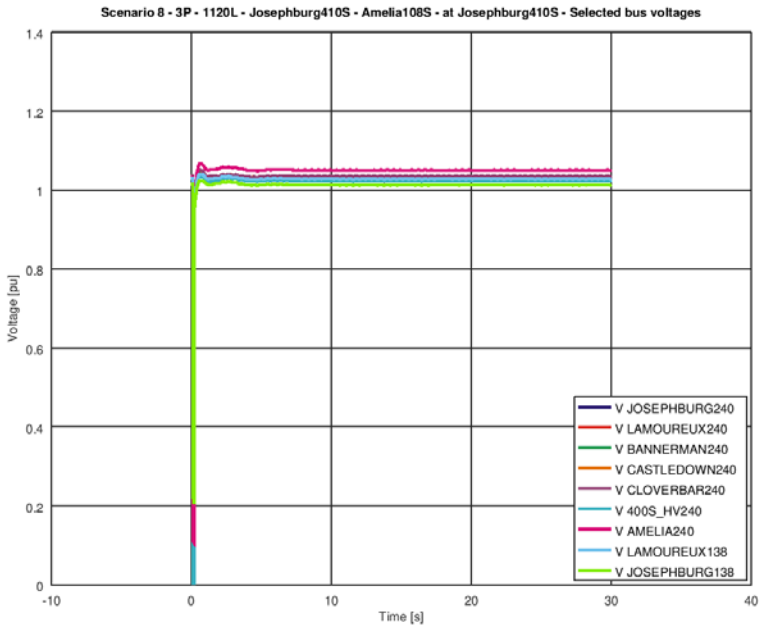


Figure A-1025 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

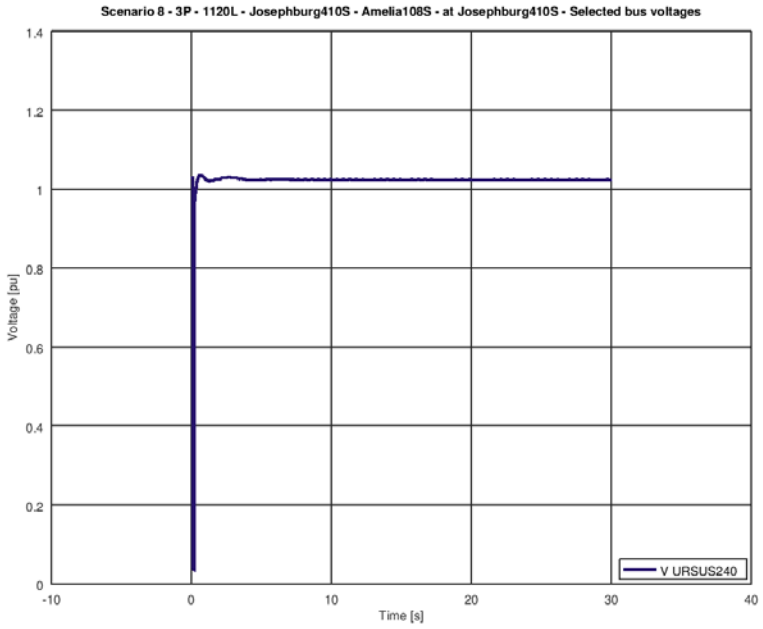


Figure A-1026 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

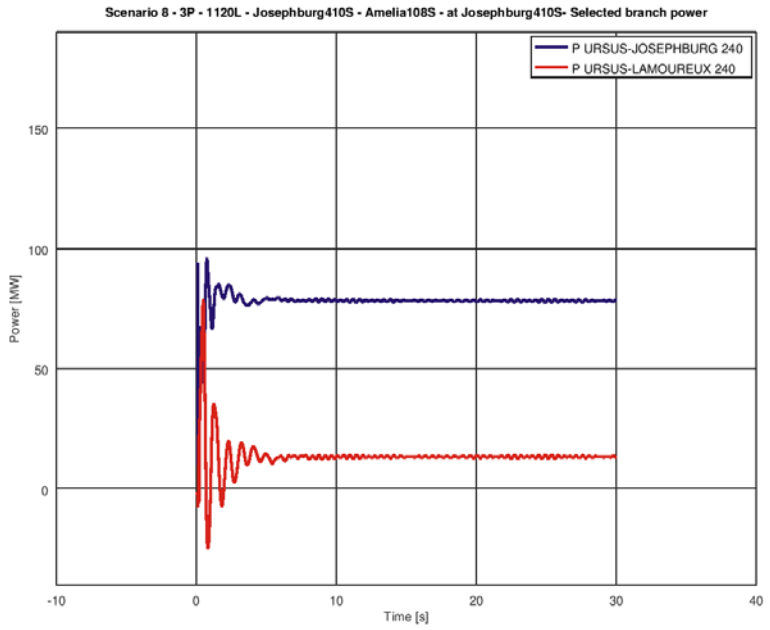


Figure A-1027 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

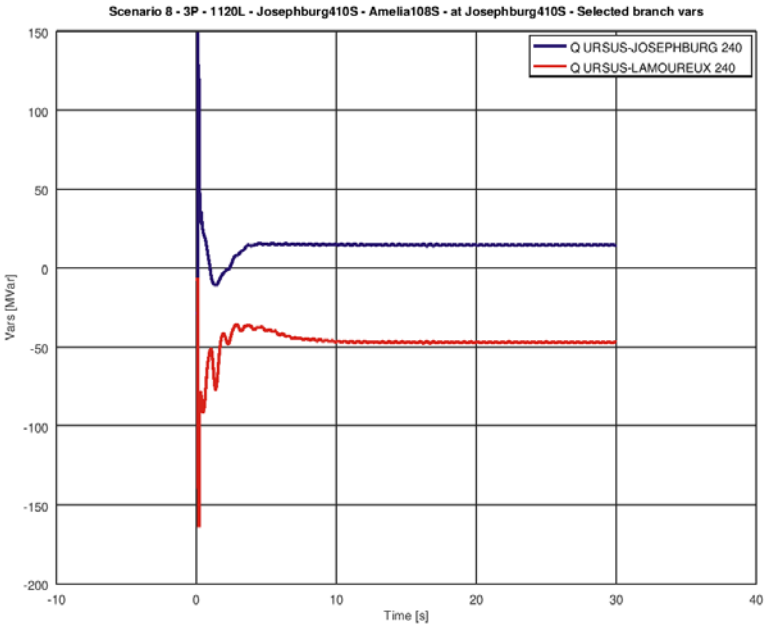


Figure A-1028 Scenario 8 - 3P - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

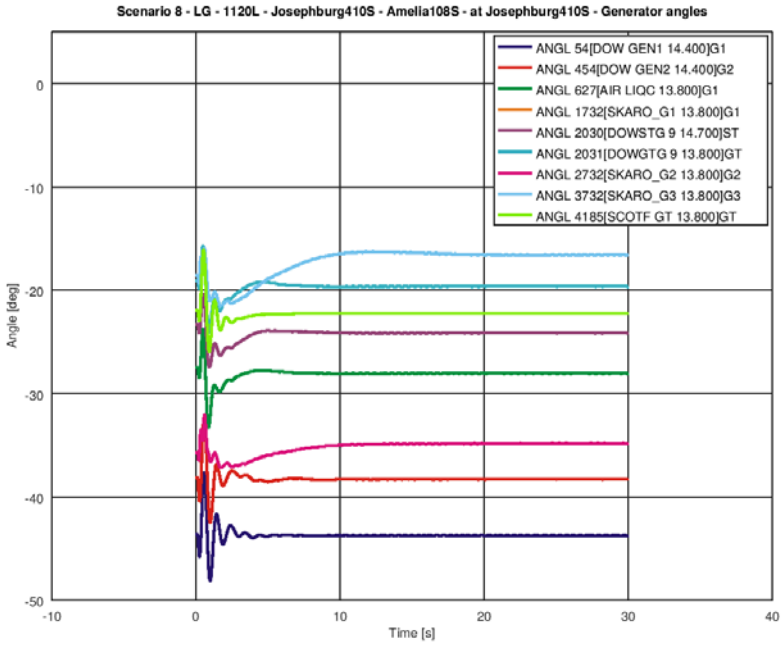


Figure A-1029 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

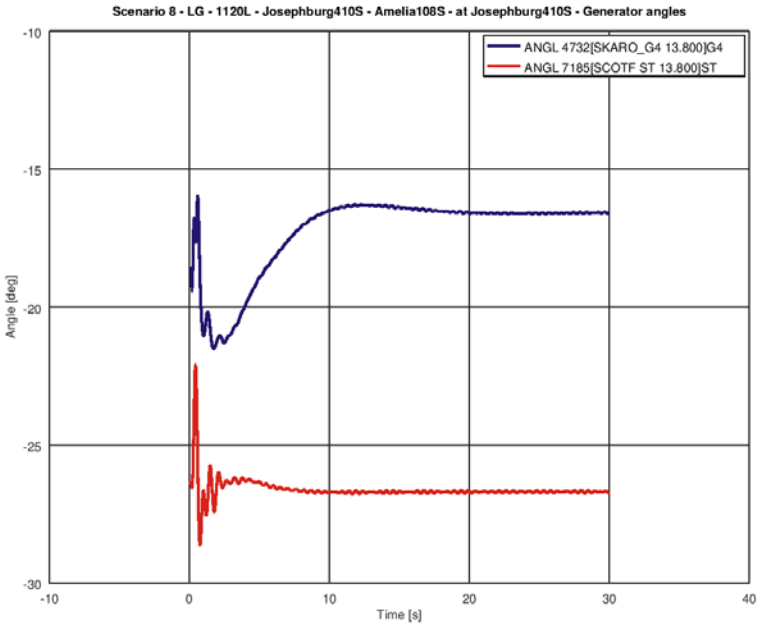


Figure A-1030 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator angles

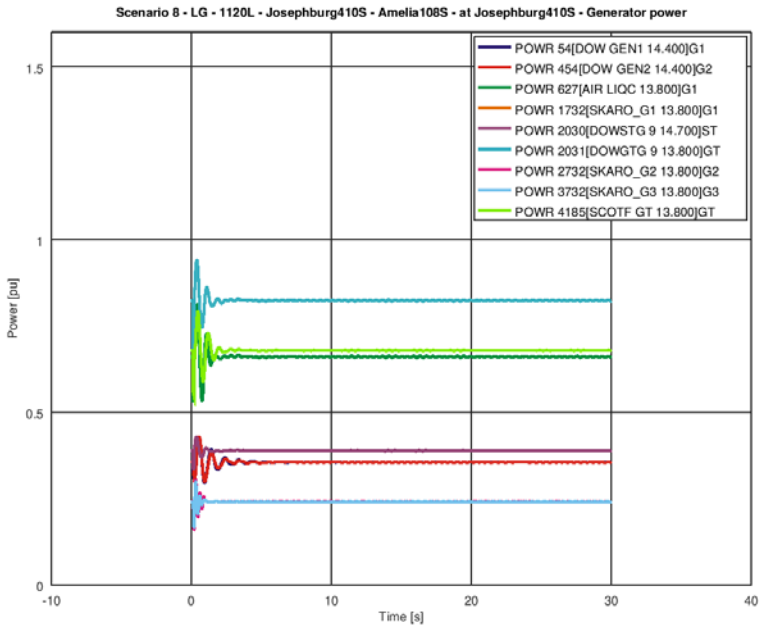


Figure A-1031 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

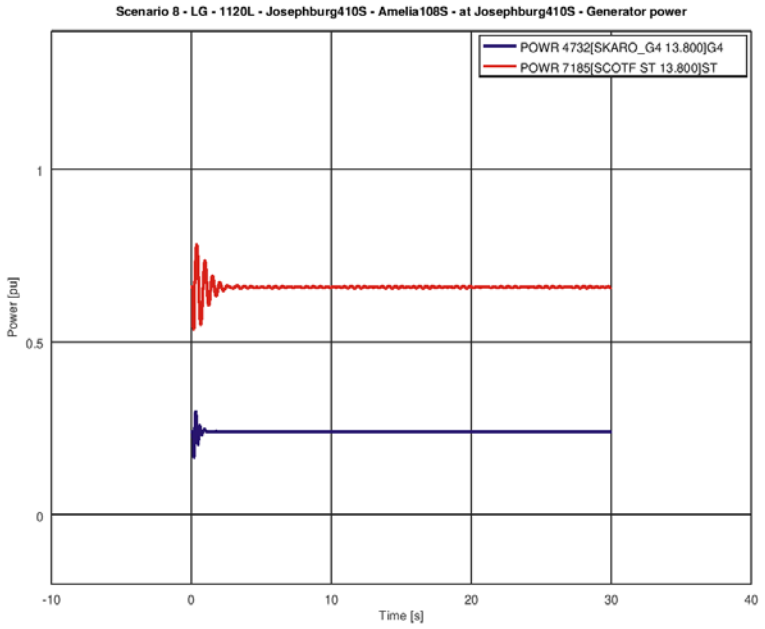


Figure A-1032 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator power

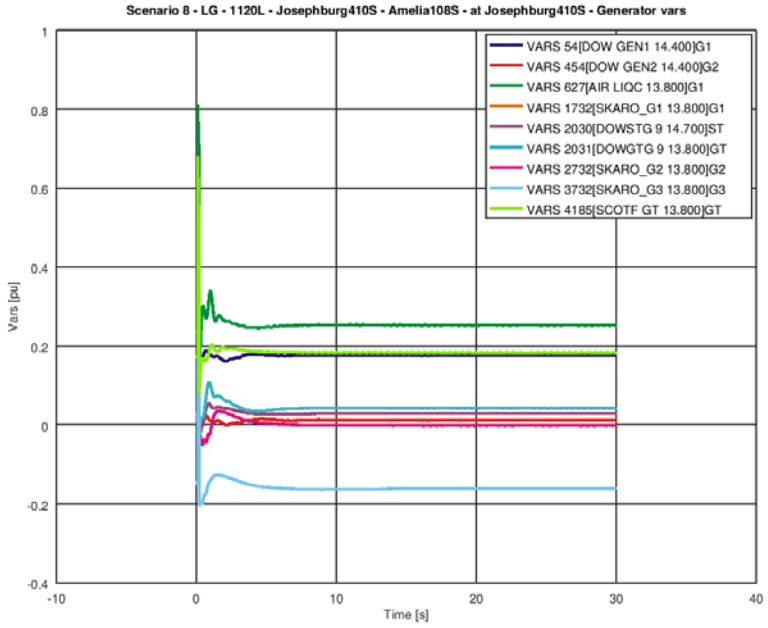


Figure A-1033 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

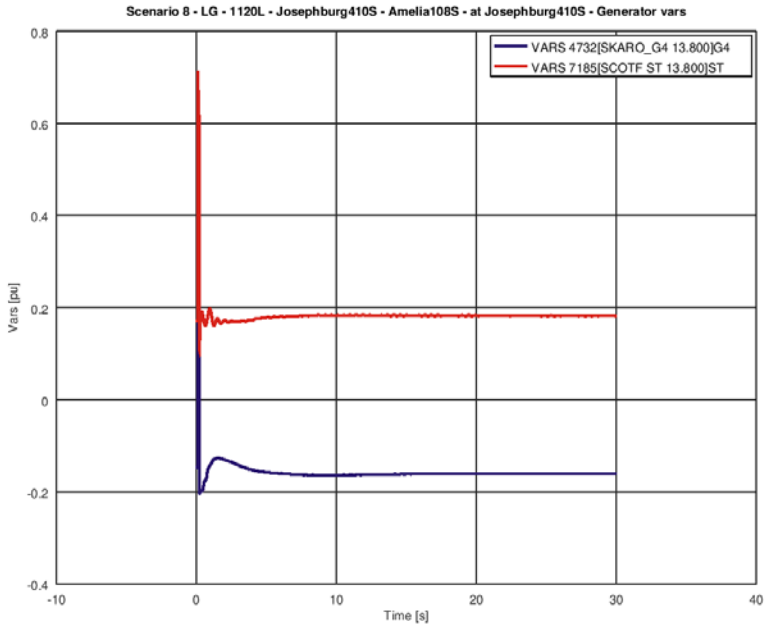


Figure A-1034 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Generator vars

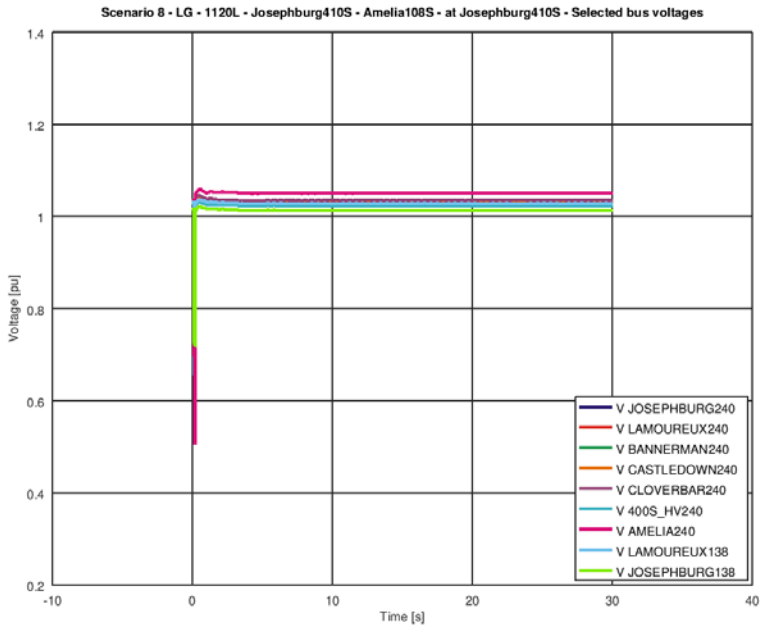


Figure A-1035 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

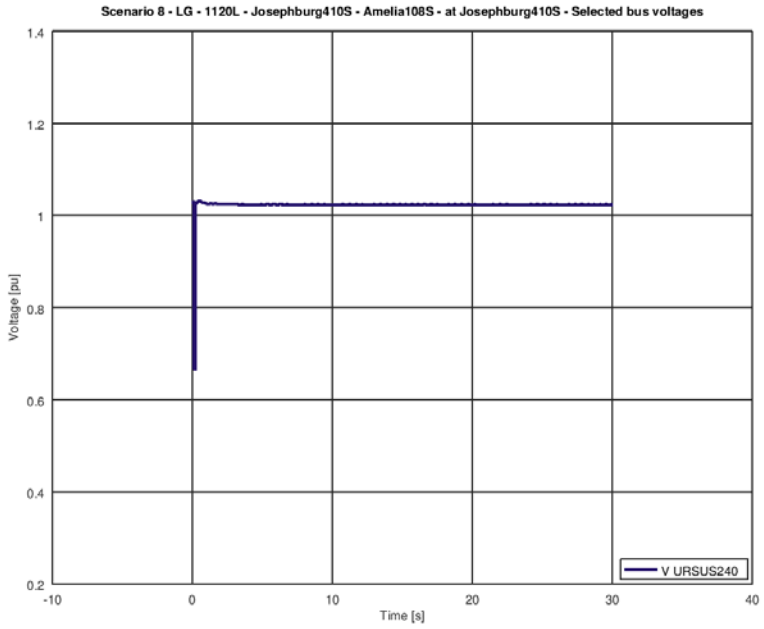


Figure A-1036 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected bus voltages

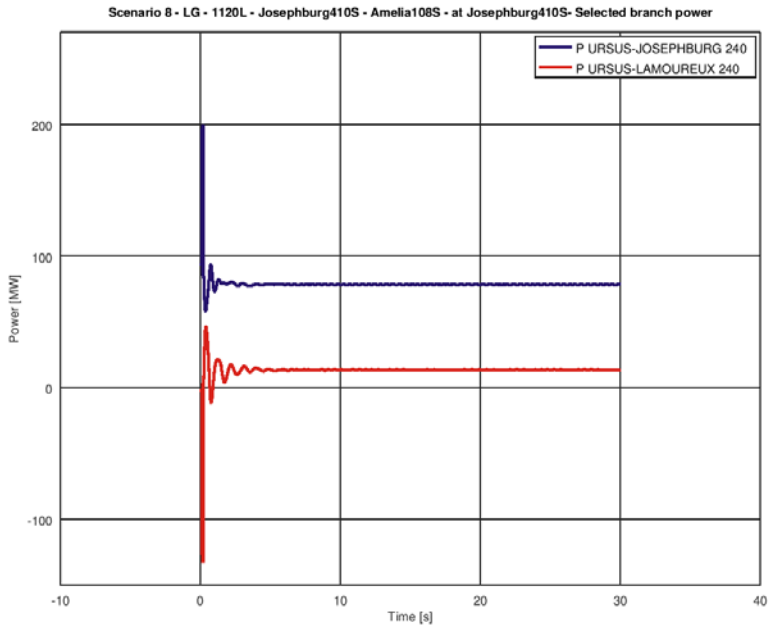


Figure A-1037 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch power

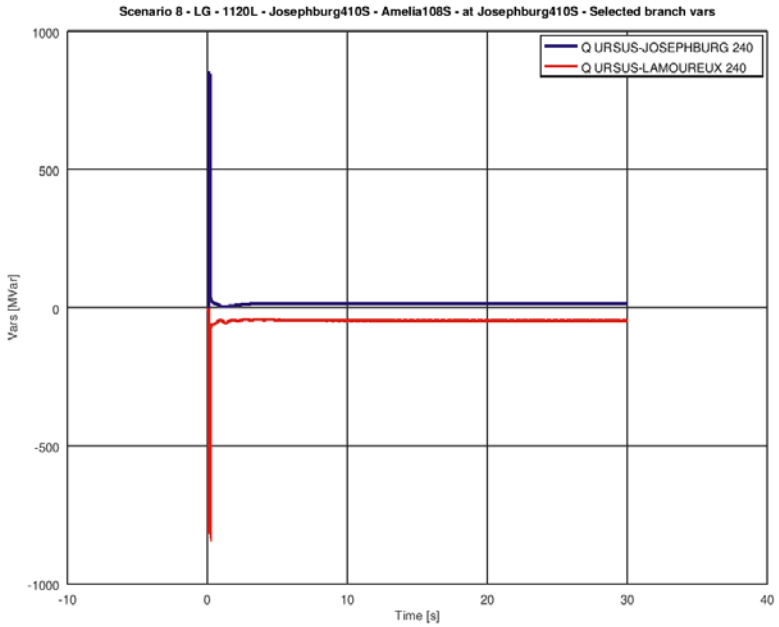


Figure A-1038 Scenario 8 - LG - 1120L - Josephburg410S - Amelia108S - at Josephburg410S - Selected branch vars

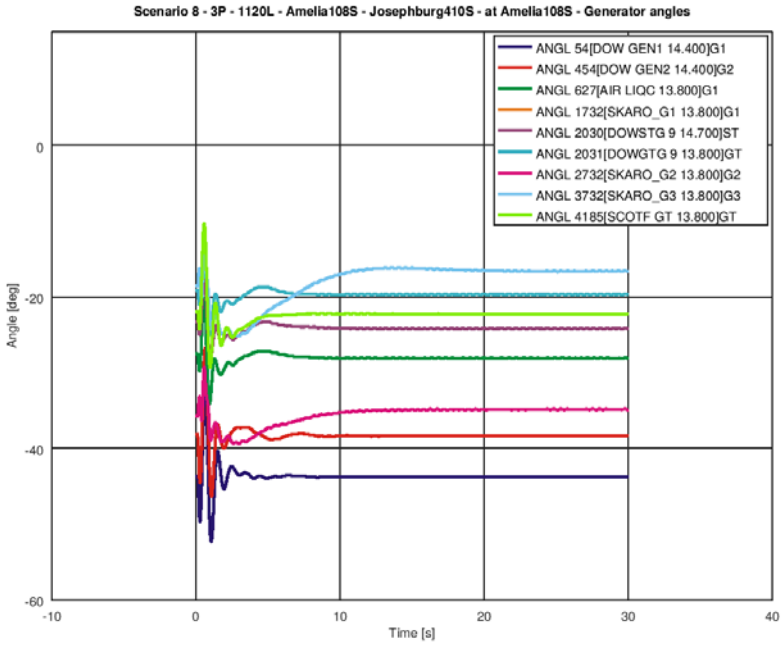


Figure A-1039 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

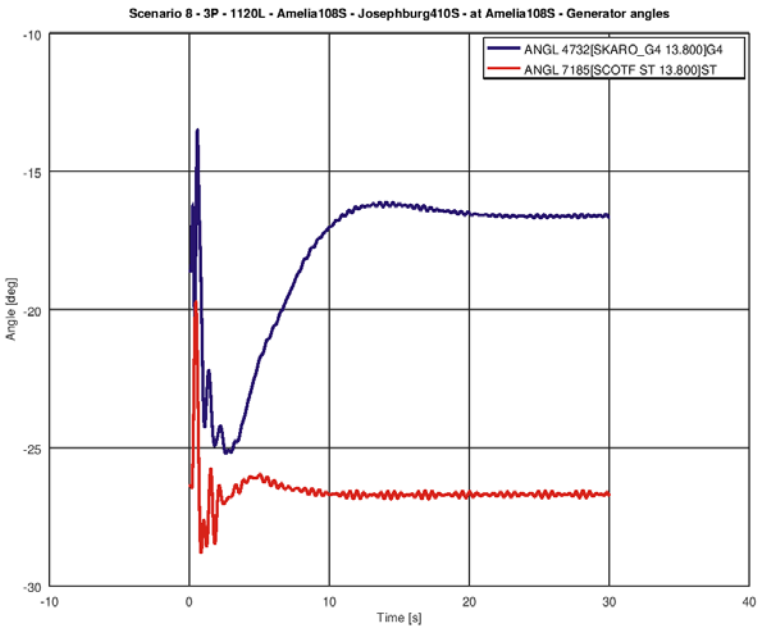


Figure A-1040 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

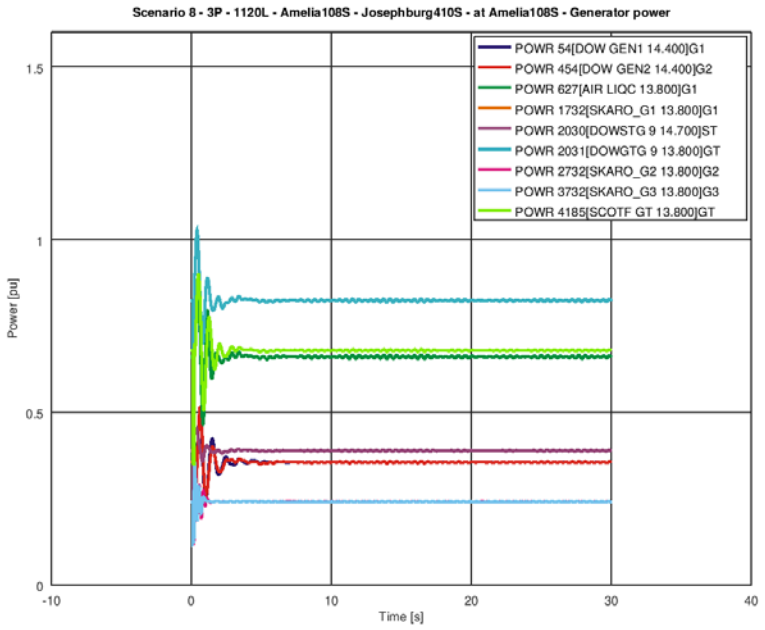


Figure A-1041 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

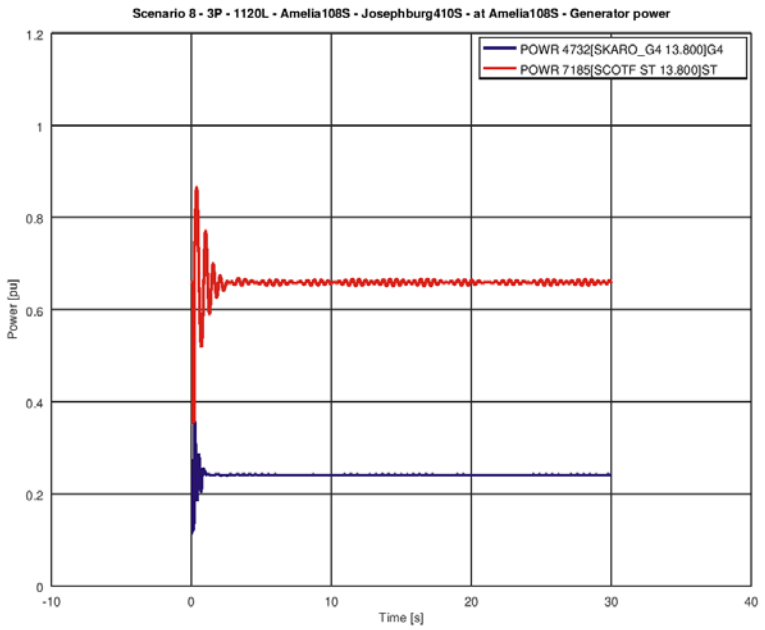


Figure A-1042 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

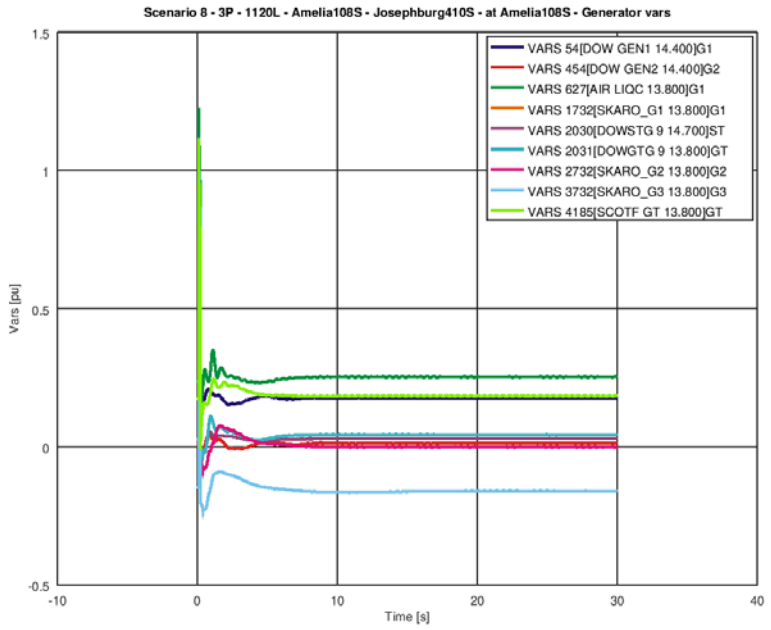


Figure A-1043 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

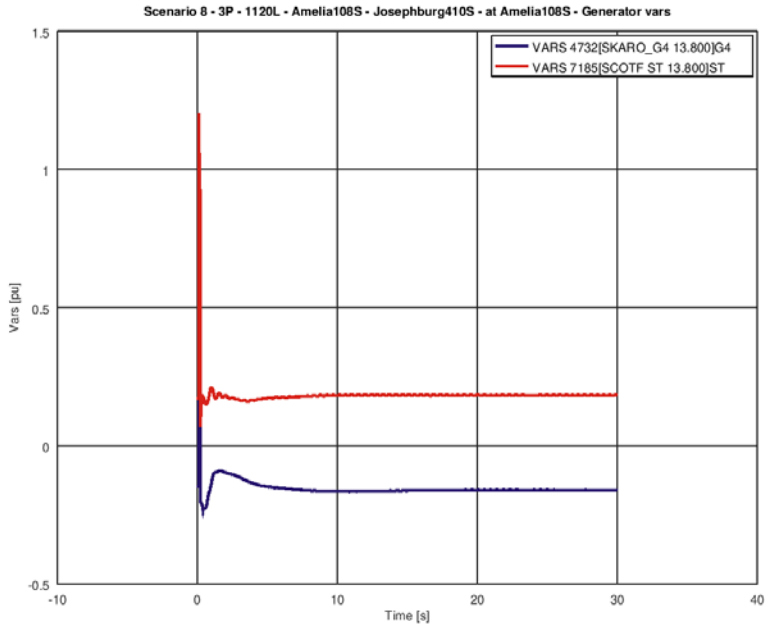


Figure A-1044 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

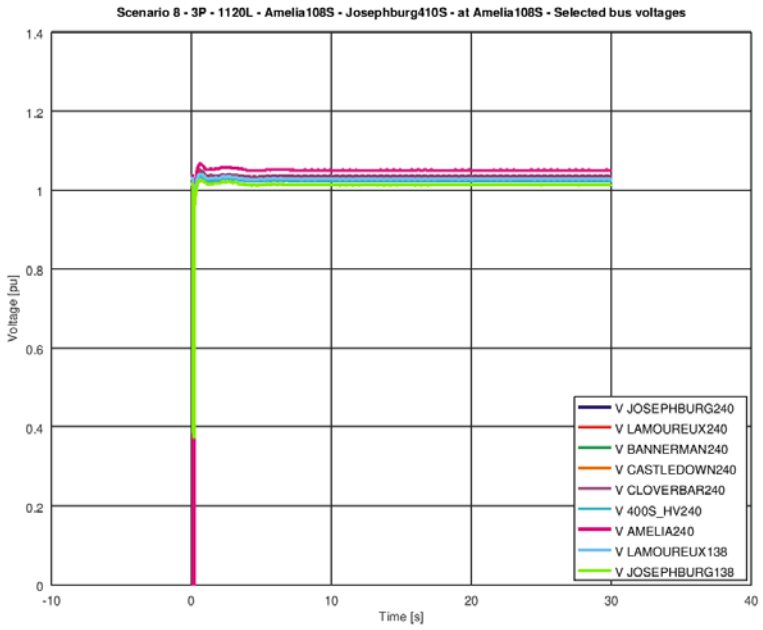


Figure A-1045 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

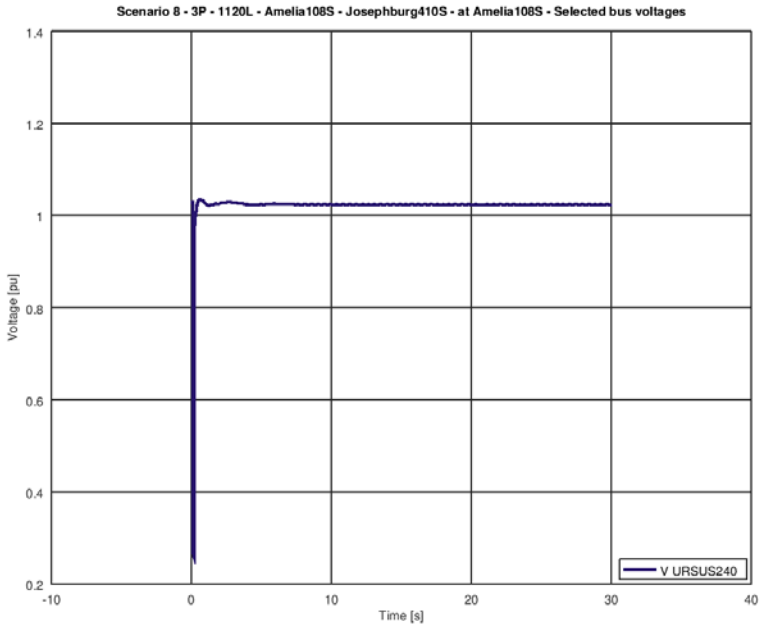


Figure A-1046 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

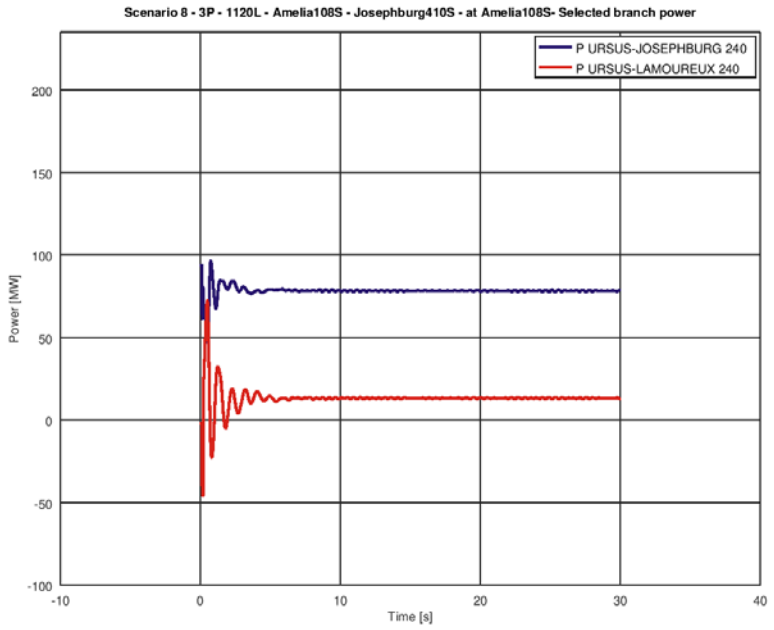


Figure A-1047 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

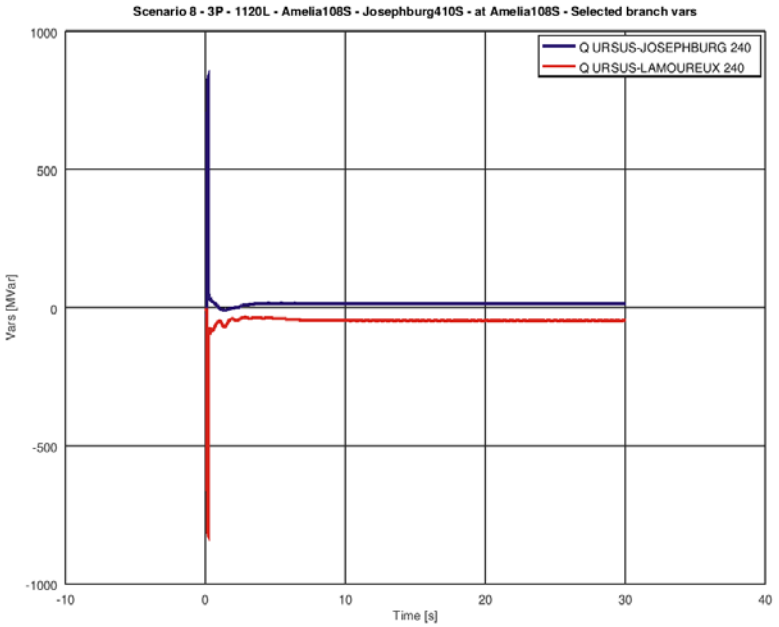


Figure A-1048 Scenario 8 - 3P - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

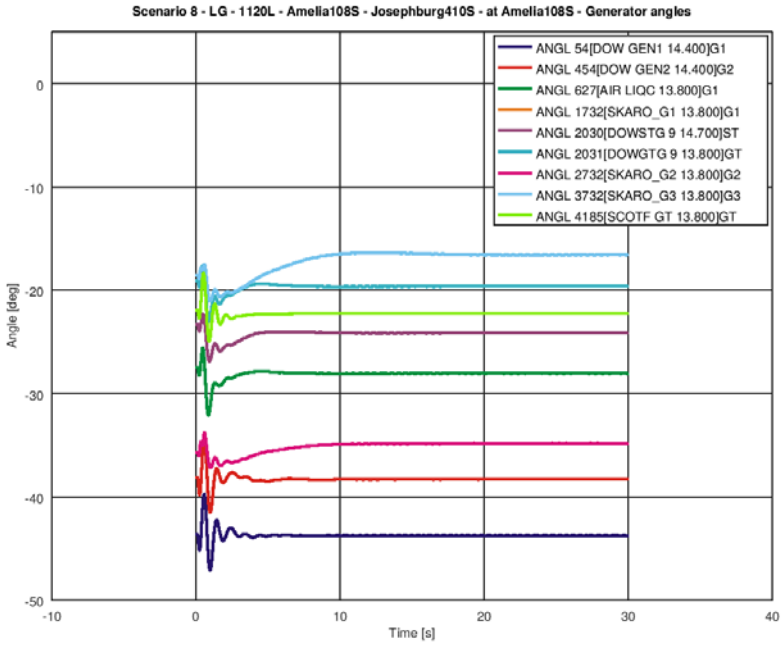


Figure A-1049 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

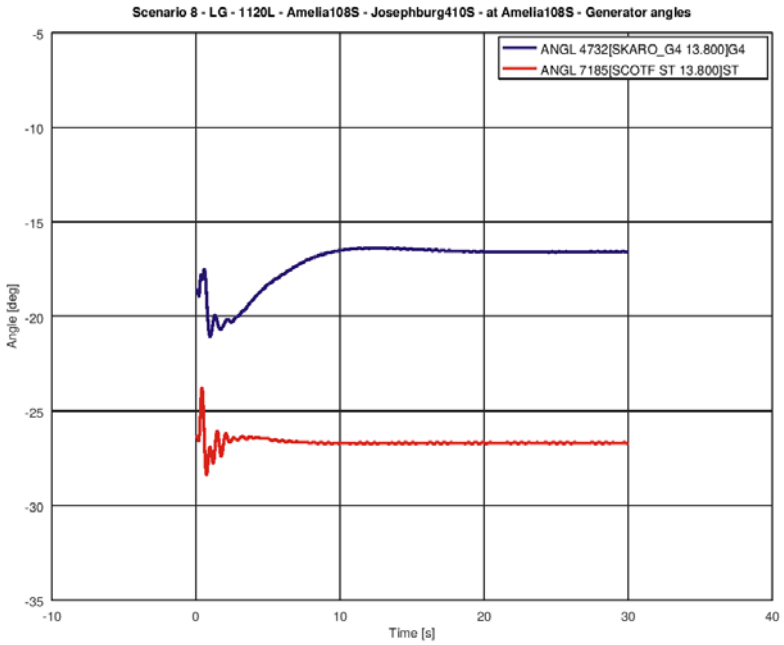


Figure A-1050 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator angles

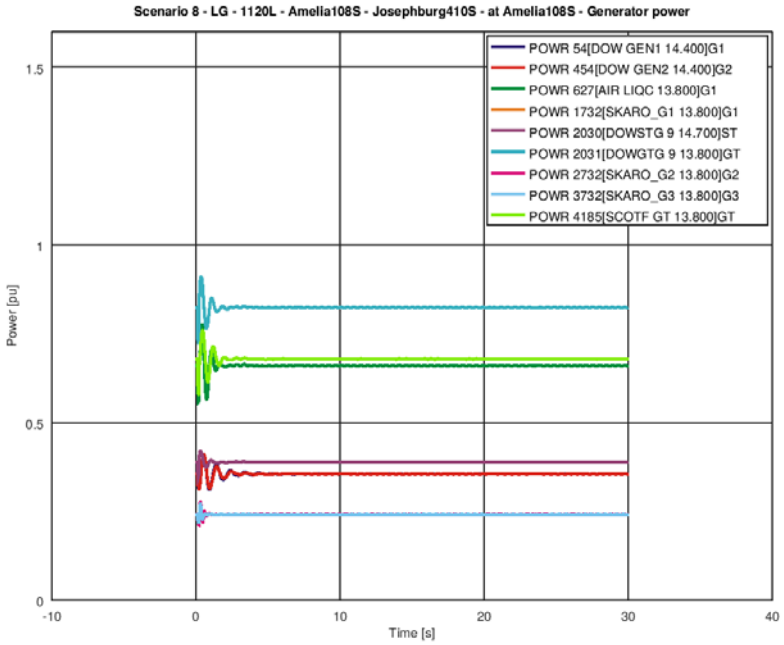


Figure A-1051 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

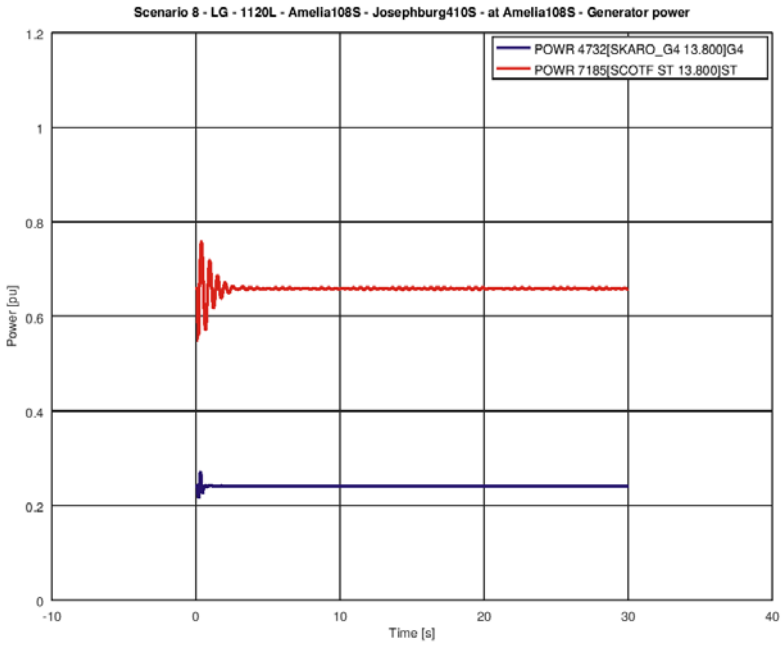


Figure A-1052 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator power

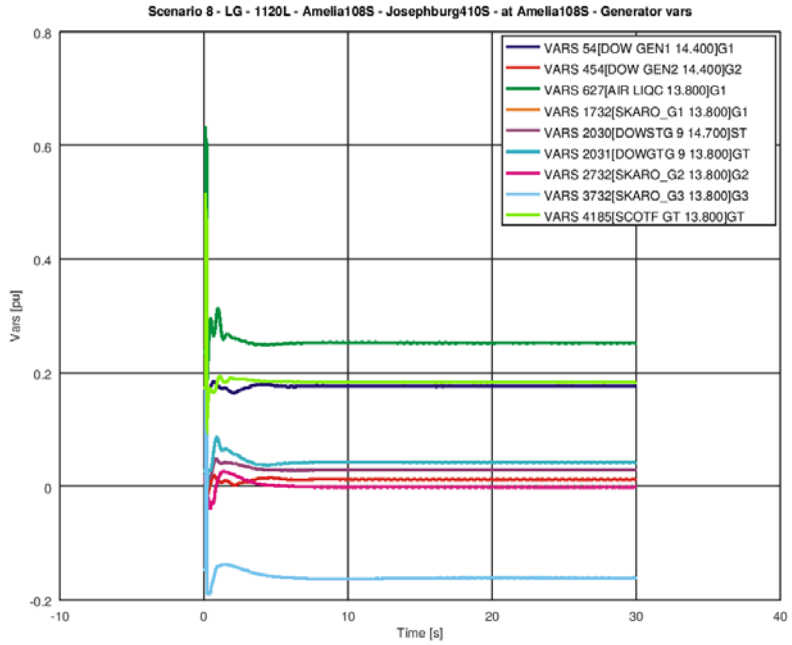


Figure A-1053 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

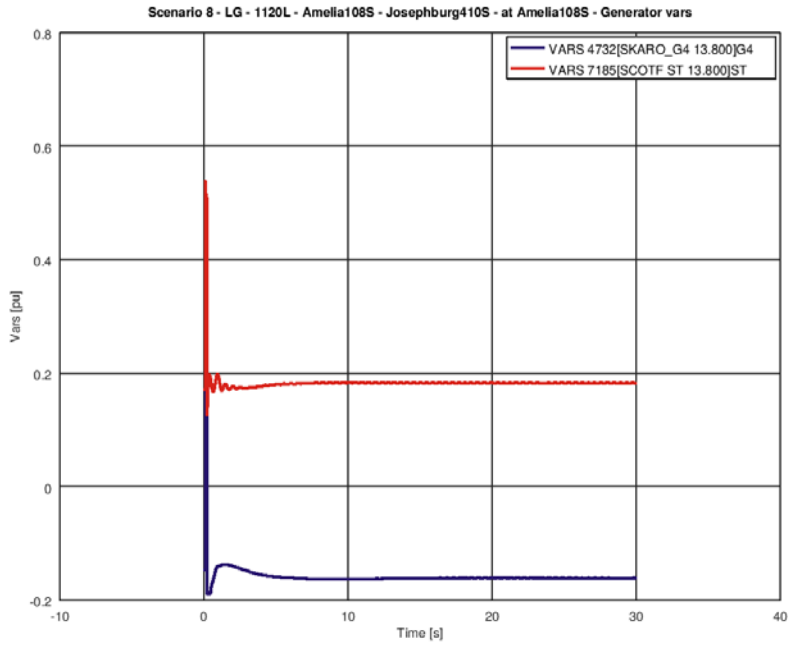


Figure A-1054 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Generator vars

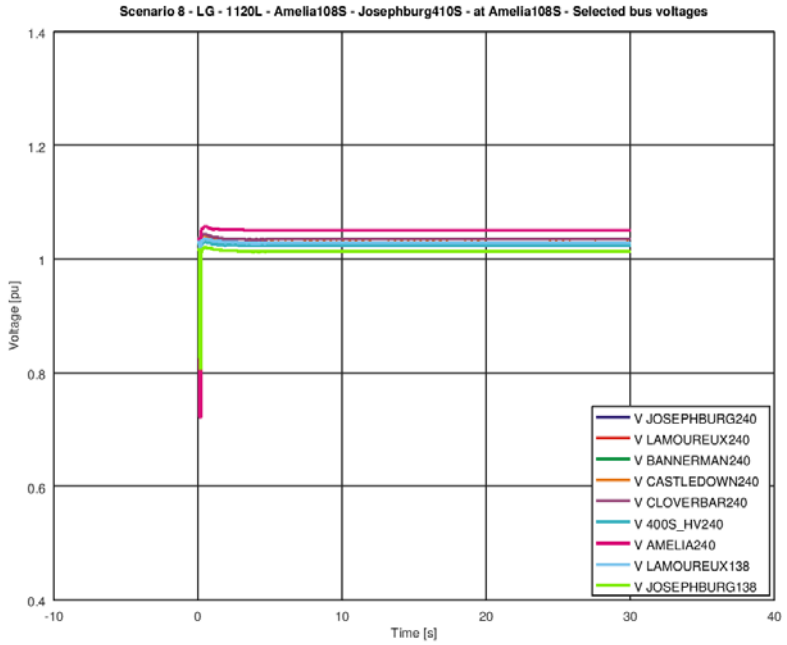


Figure A-1055 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

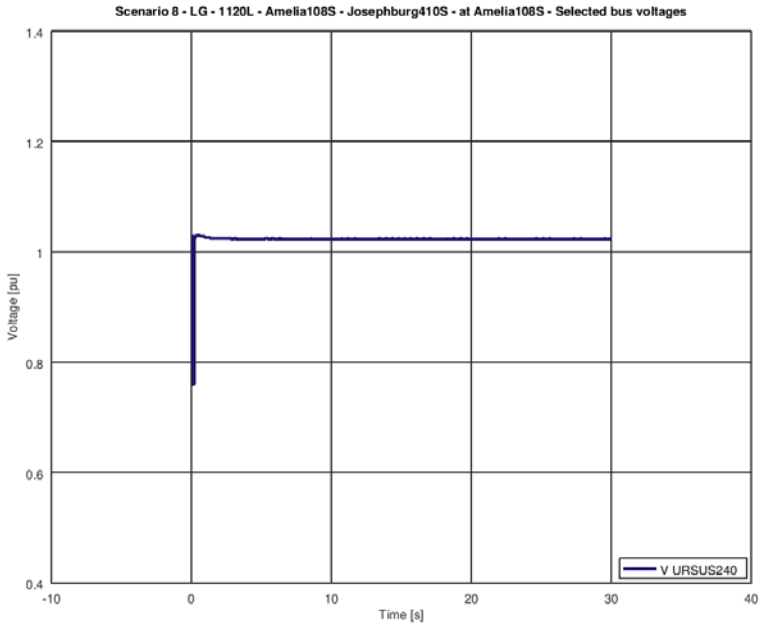


Figure A-1056 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected bus voltages

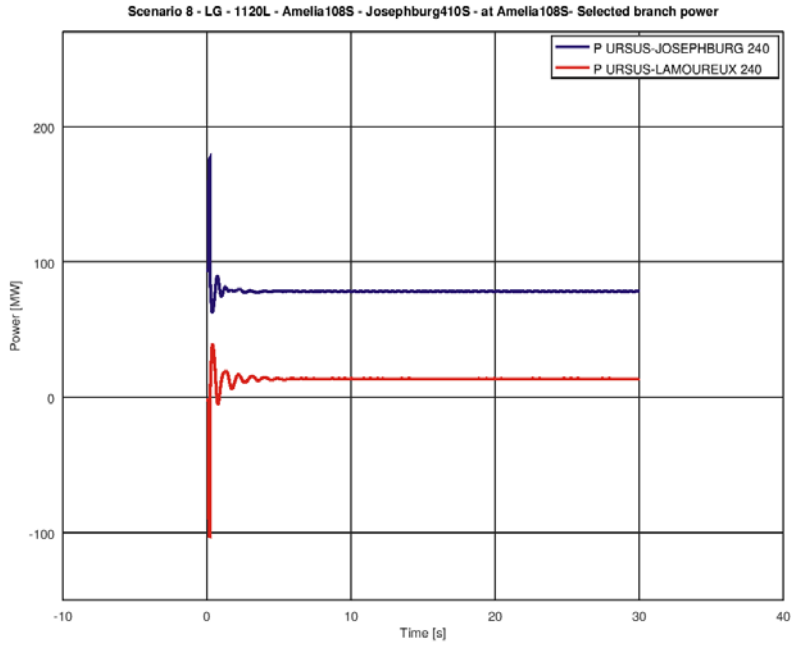


Figure A-1057 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch power

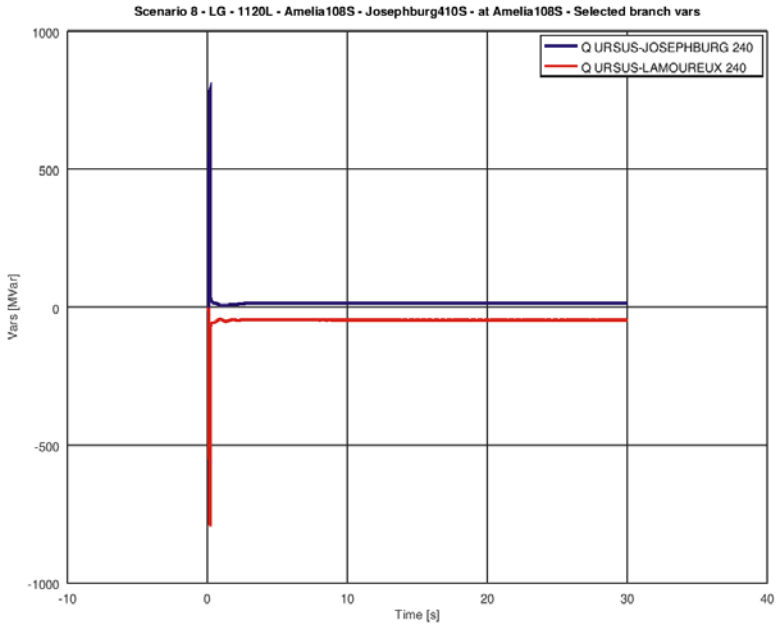


Figure A-1058 Scenario 8 - LG - 1120L - Amelia108S - Josephburg410S - at Amelia108S - Selected branch vars

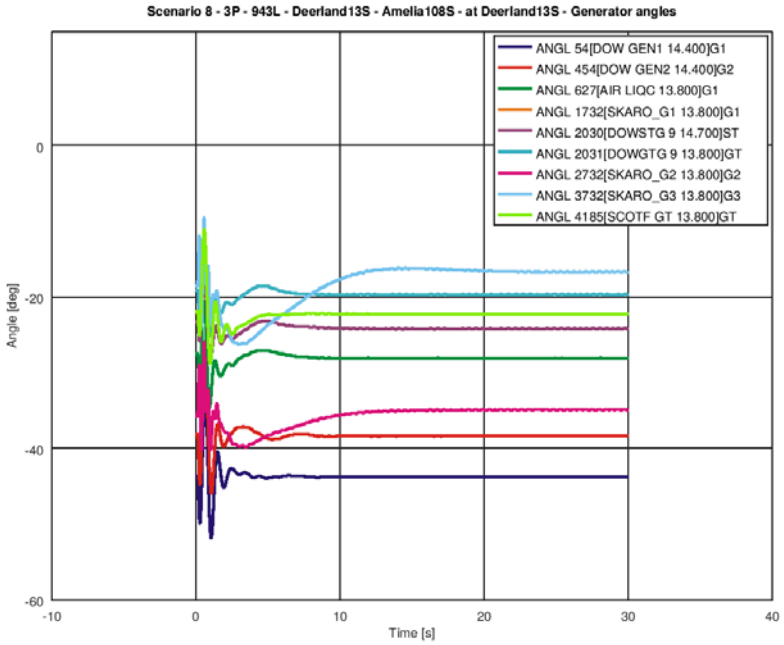


Figure A-1059 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

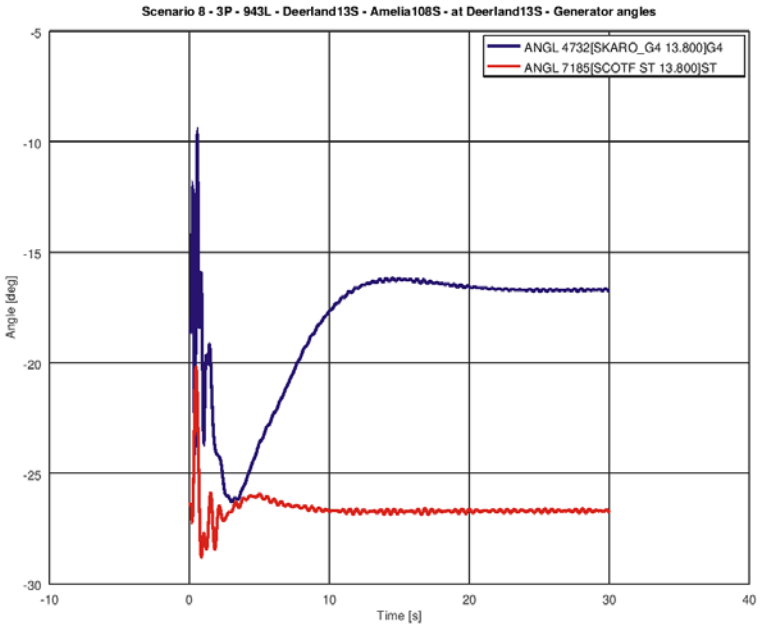


Figure A-1060 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

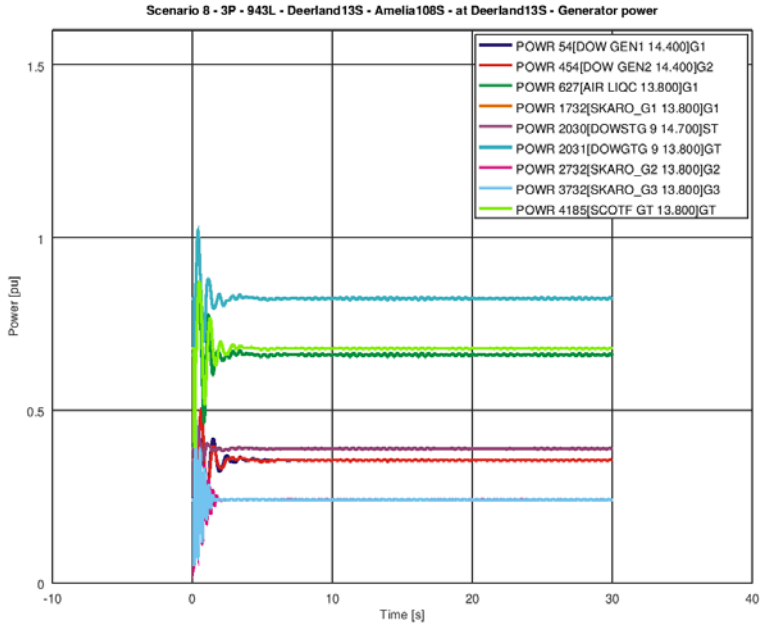


Figure A-1061 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

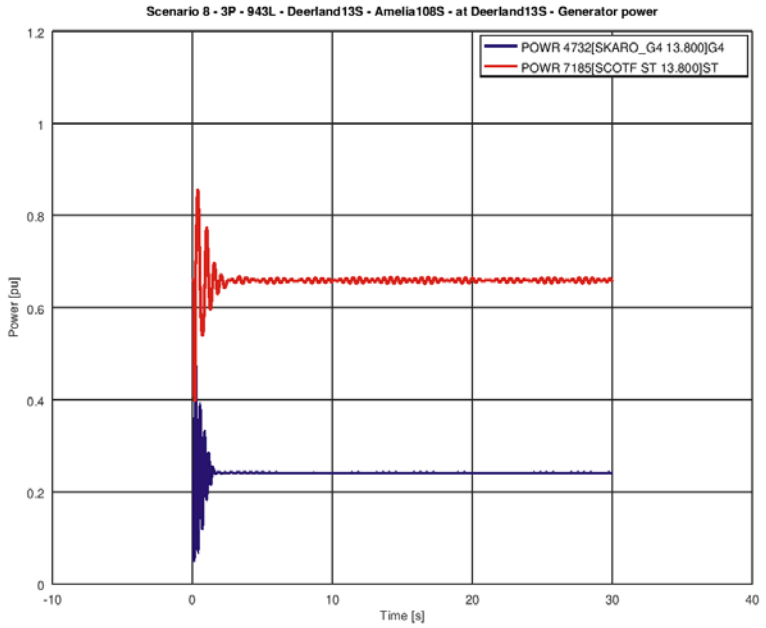


Figure A-1062 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

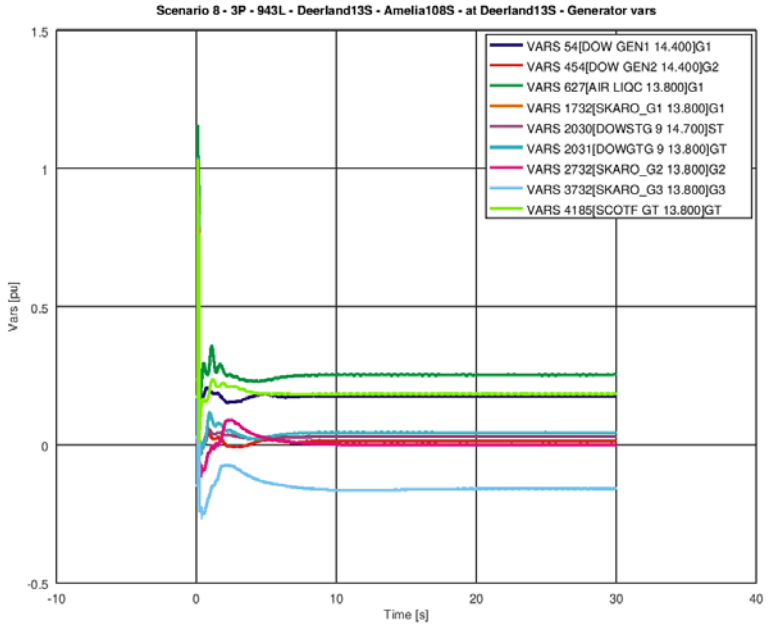


Figure A-1063 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

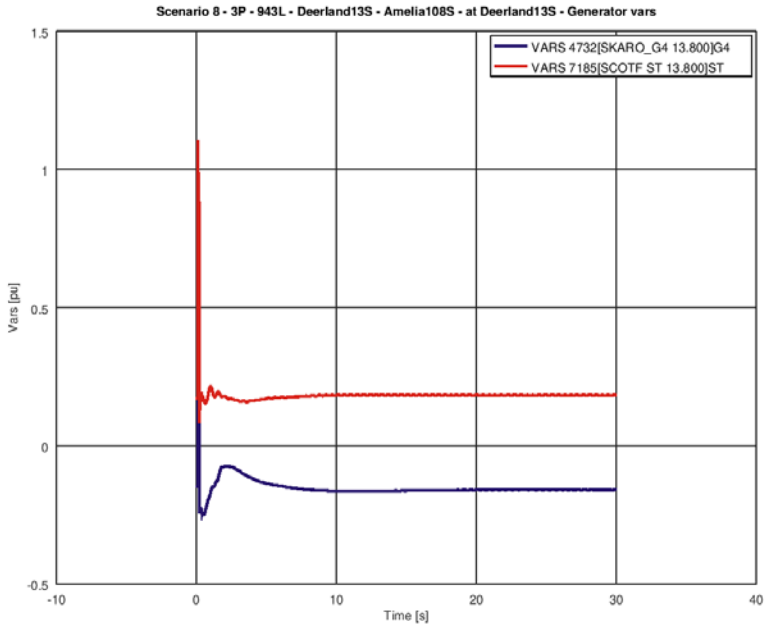


Figure A-1064 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

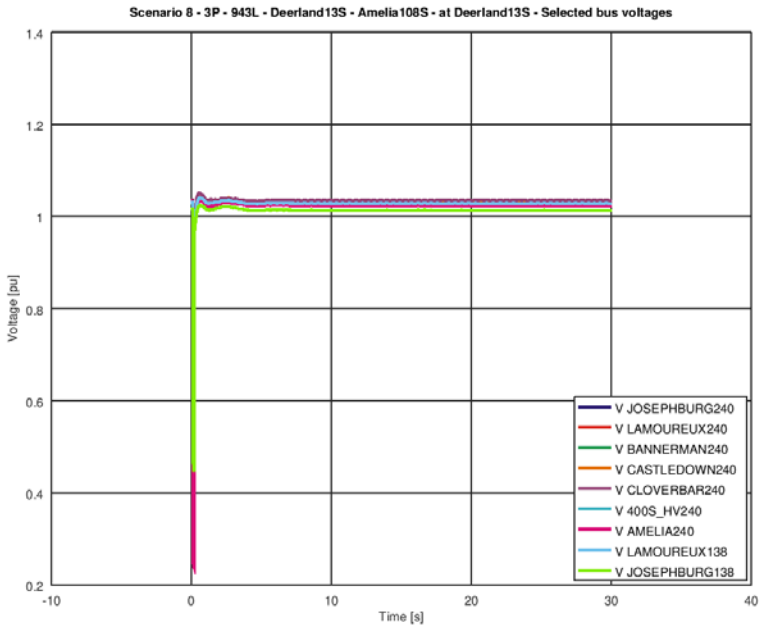


Figure A-1065 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

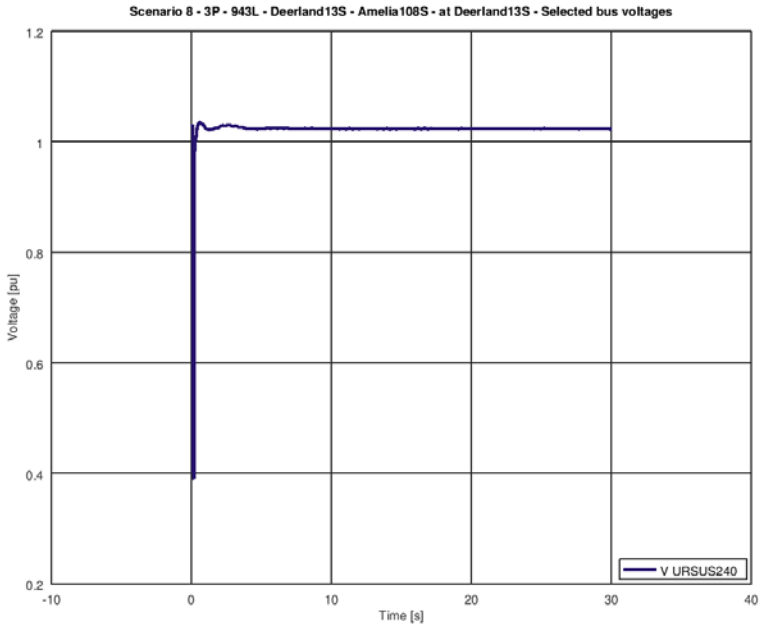


Figure A-1066 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

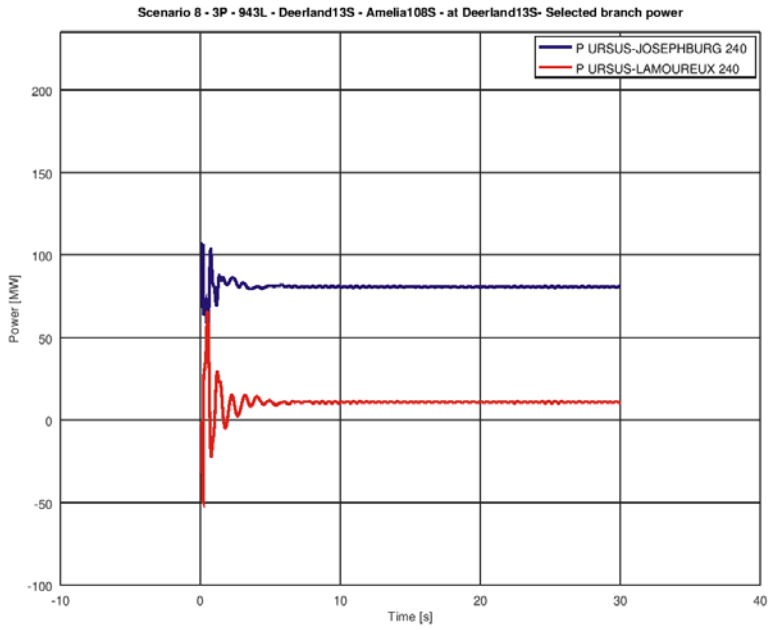


Figure A-1067 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

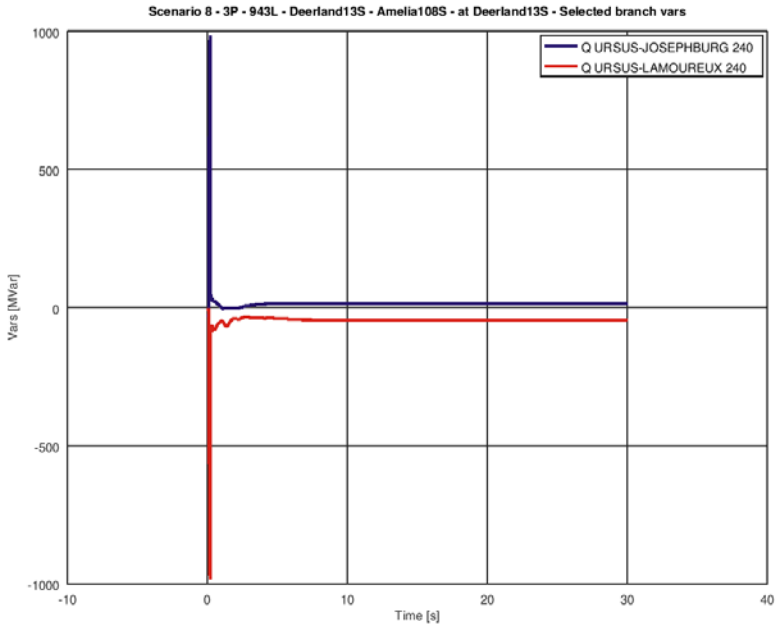


Figure A-1068 Scenario 8 - 3P - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

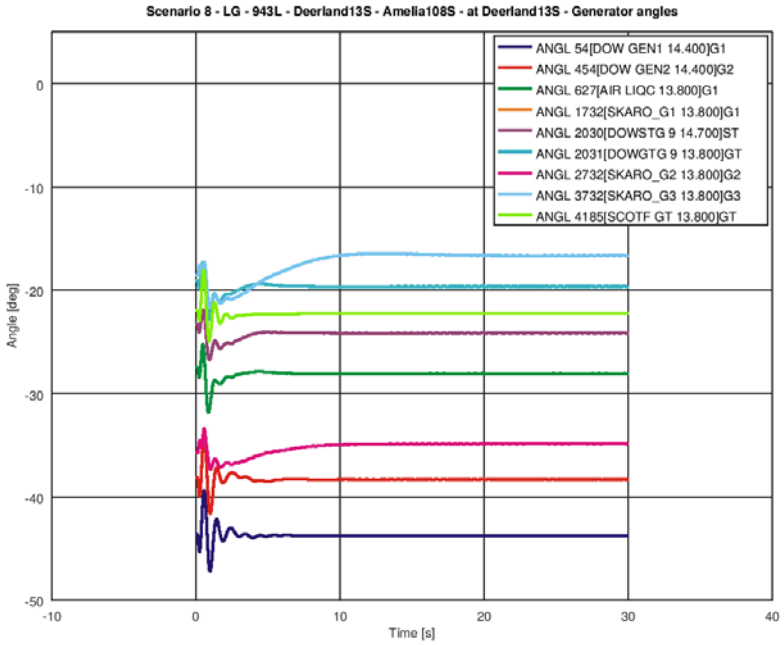


Figure A-1069 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

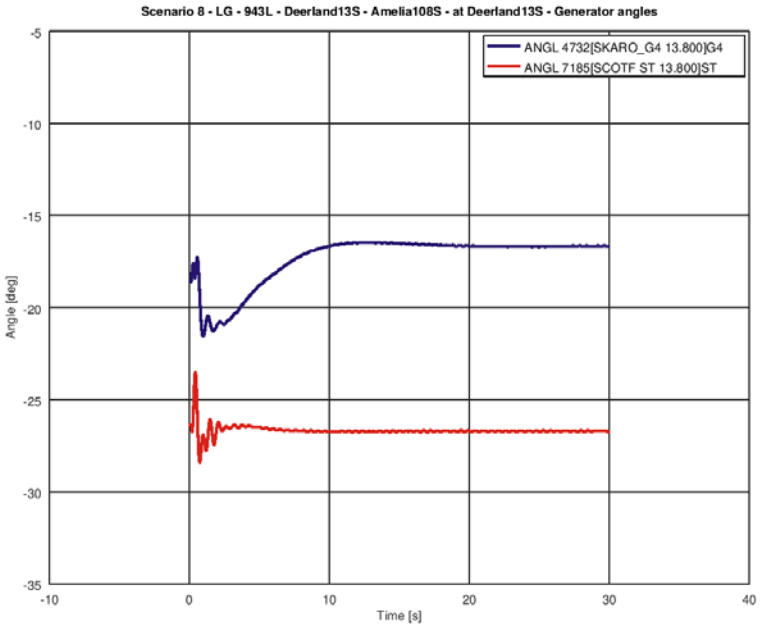


Figure A-1070 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator angles

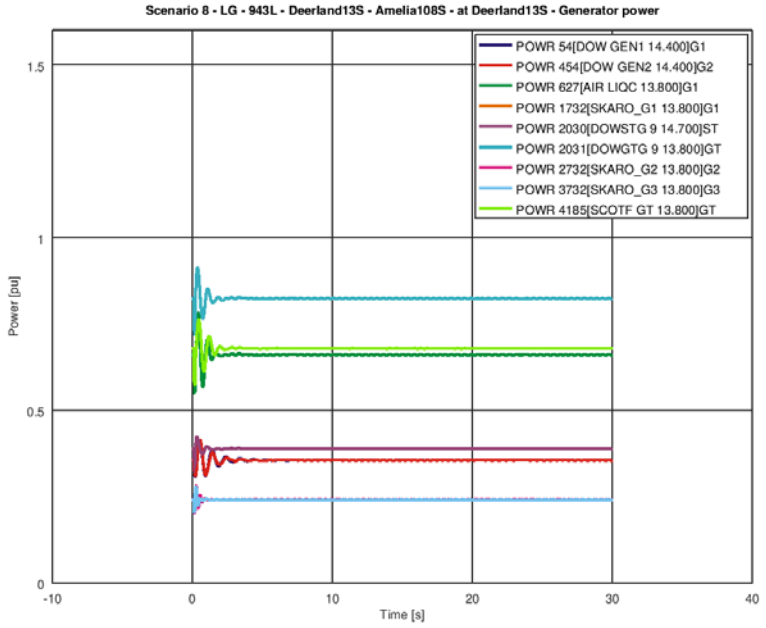


Figure A-1071 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

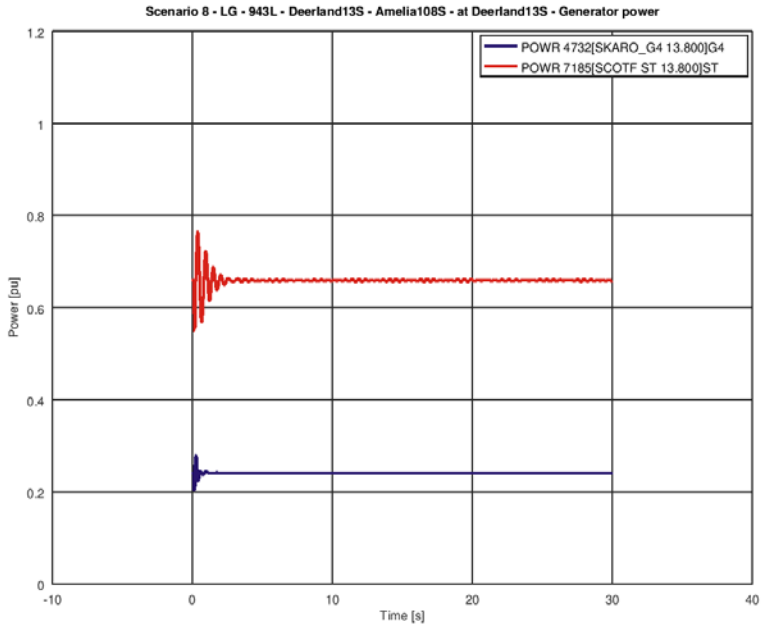


Figure A-1072 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator power

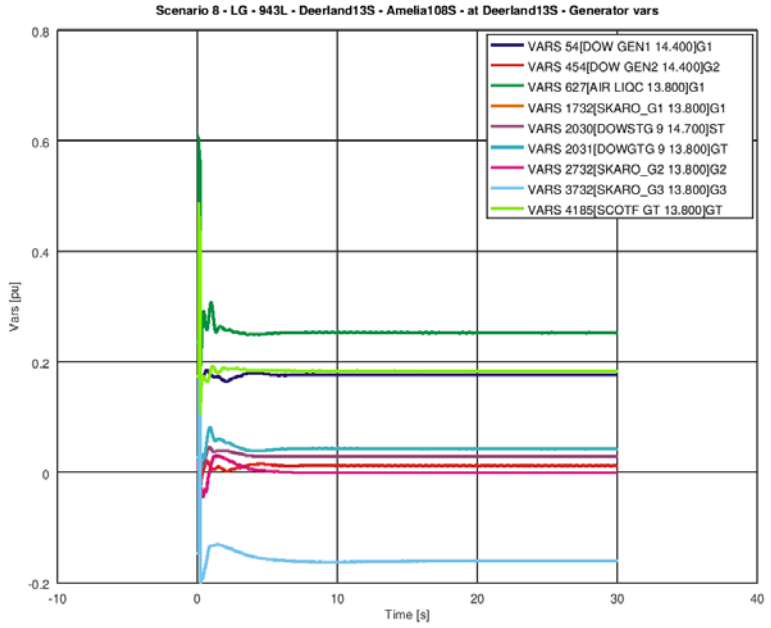


Figure A-1073 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

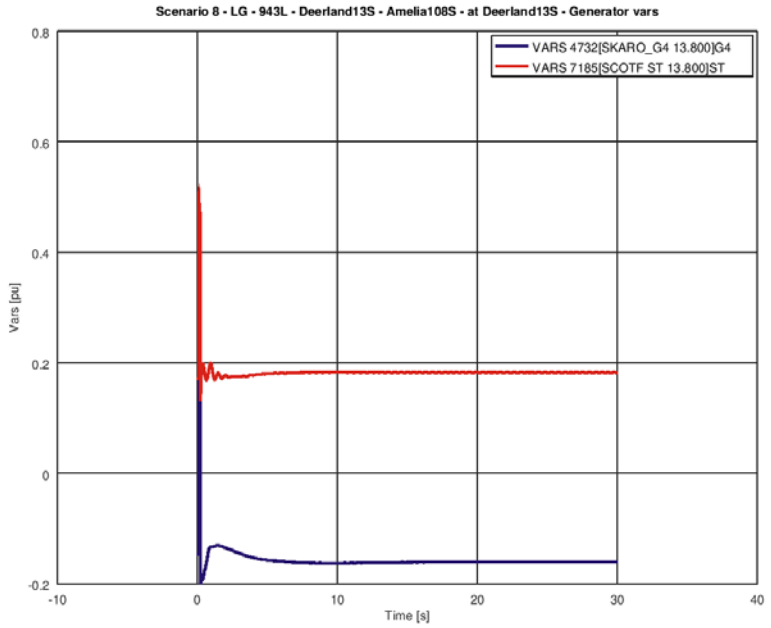


Figure A-1074 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Generator vars

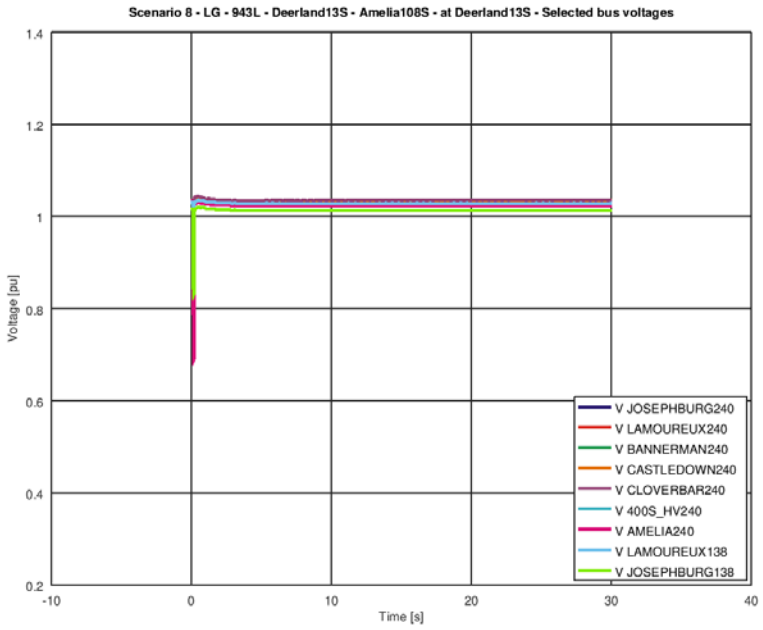


Figure A-1075 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

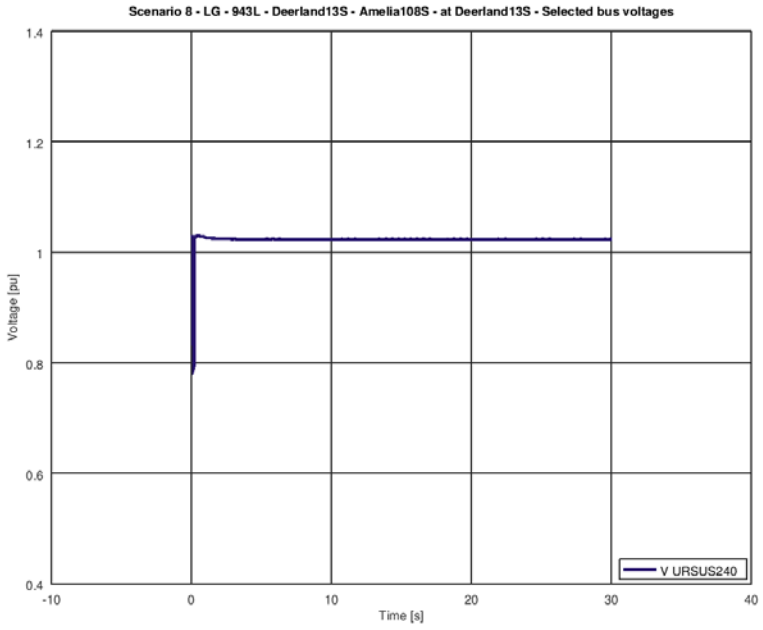


Figure A-1076 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected bus voltages

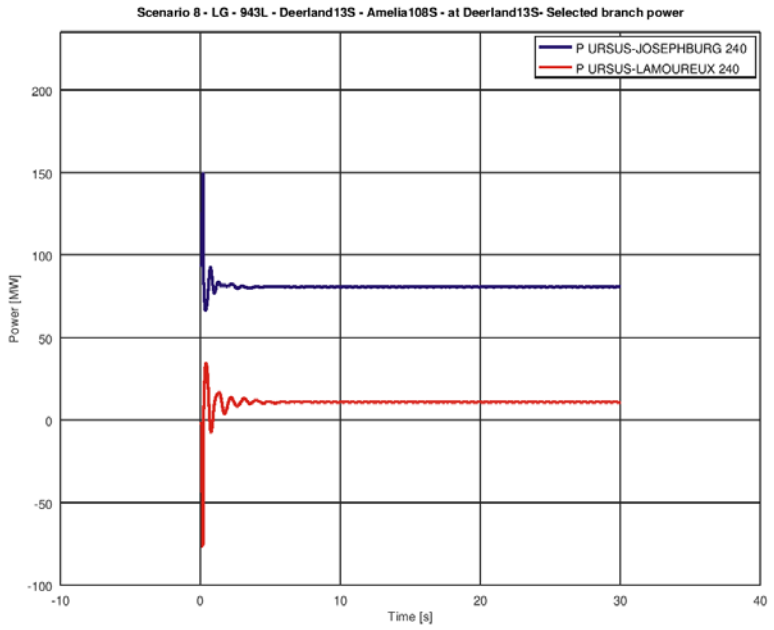


Figure A-1077 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch power

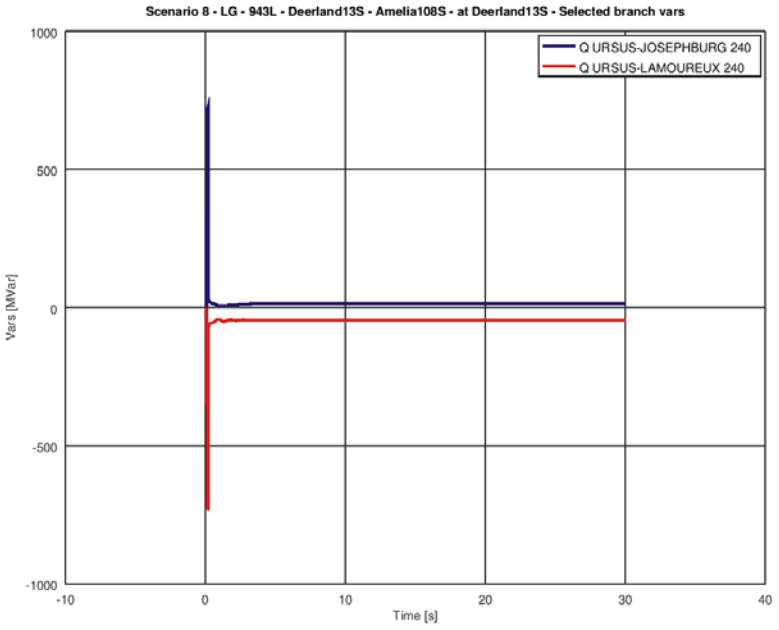


Figure A-1078 Scenario 8 - LG - 943L - Deerland13S - Amelia108S - at Deerland13S - Selected branch vars

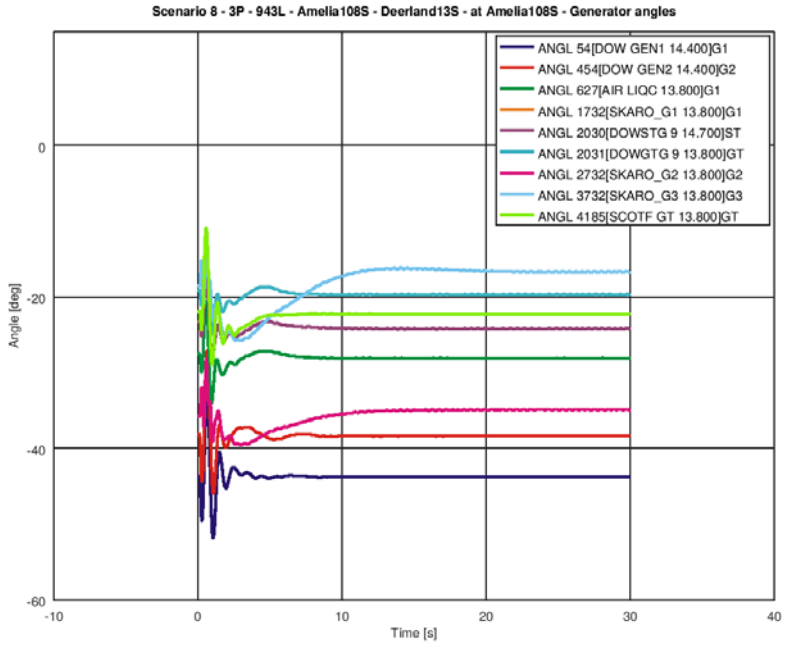


Figure A-1079 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

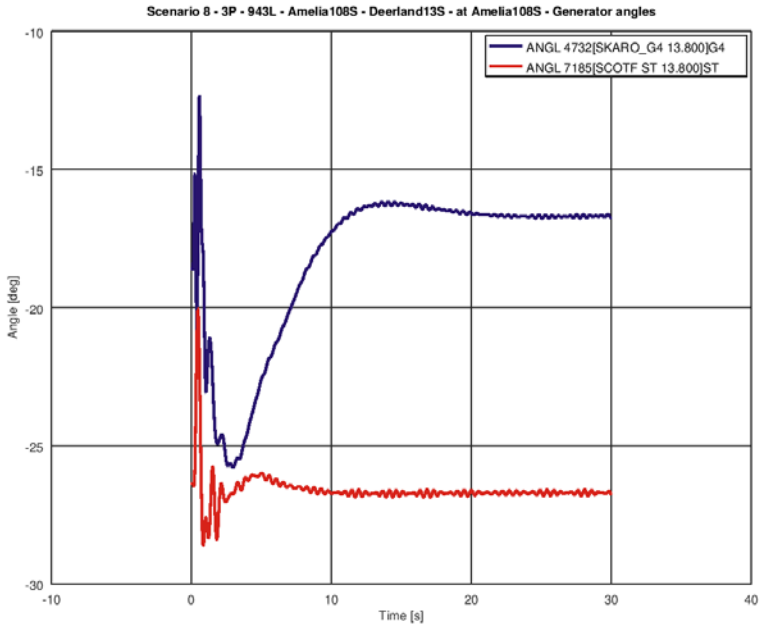


Figure A-1080 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

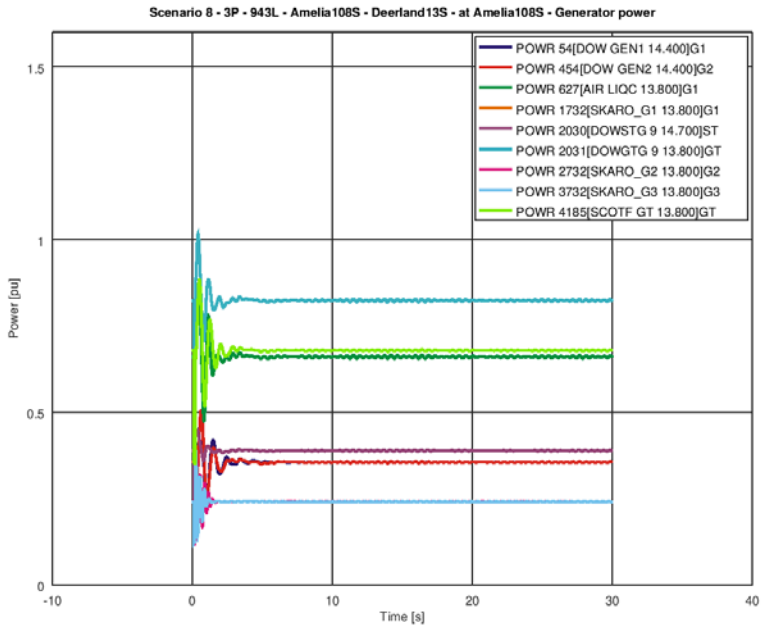


Figure A-1081 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

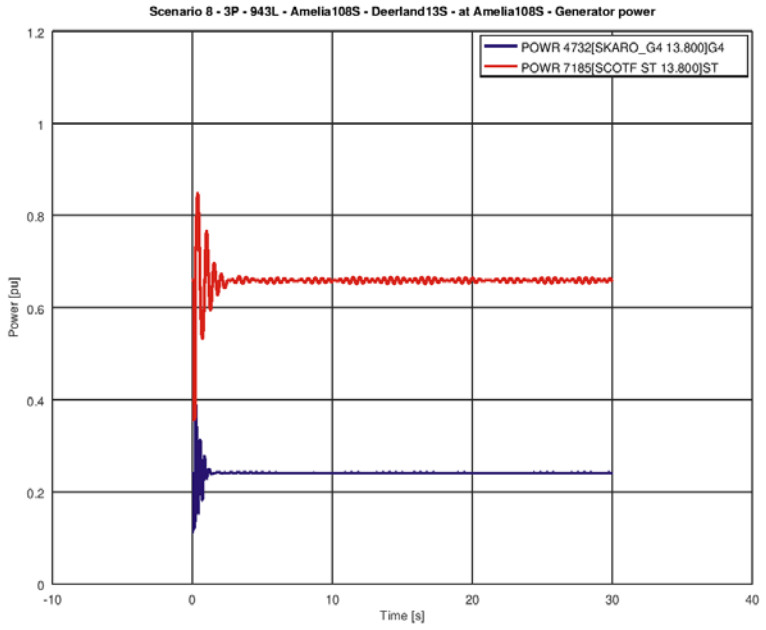


Figure A-1082 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

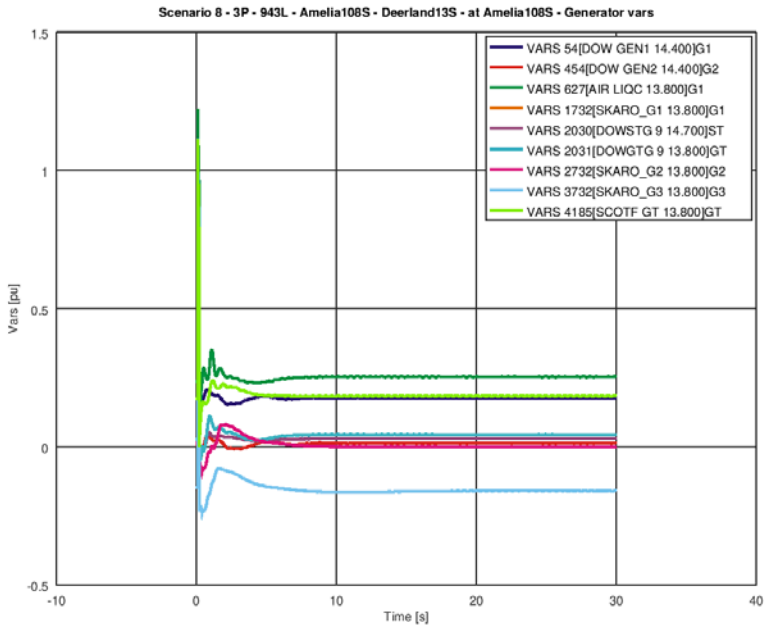


Figure A-1083 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

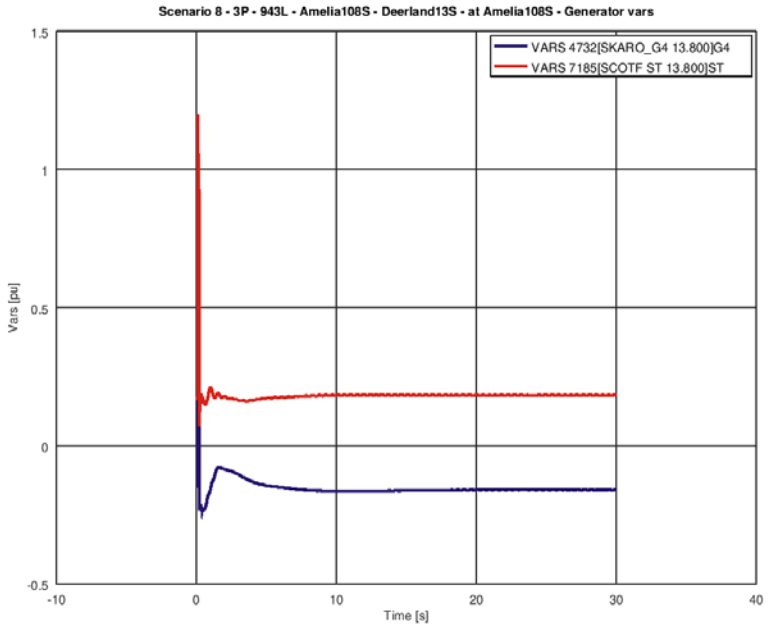


Figure A-1084 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

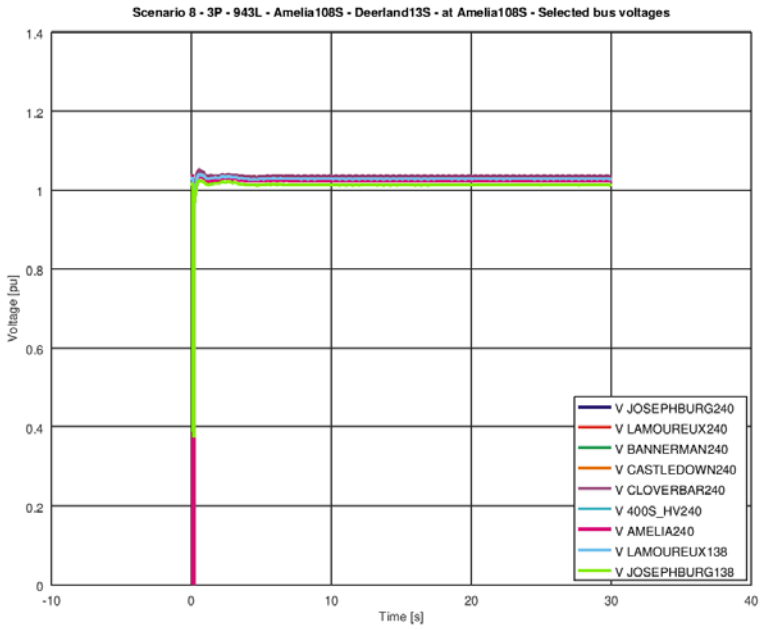


Figure A-1085 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

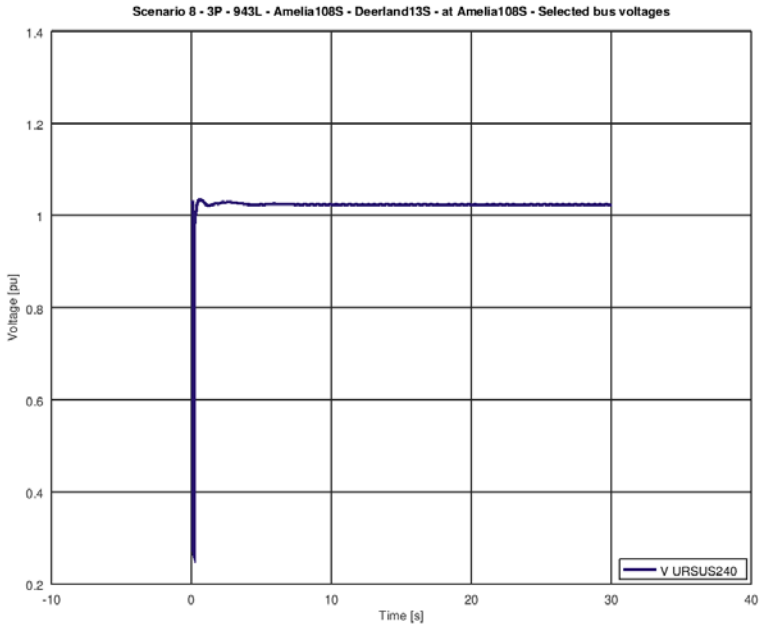


Figure A-1086 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

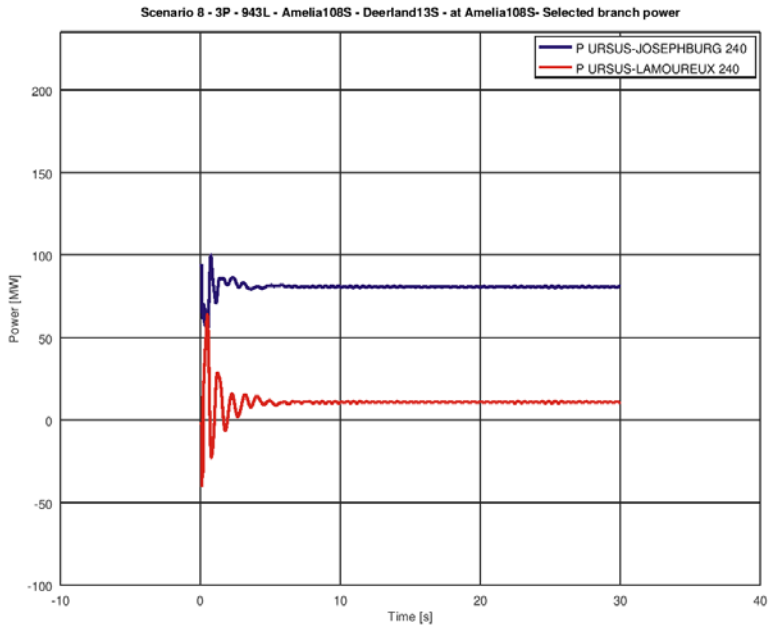


Figure A-1087 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

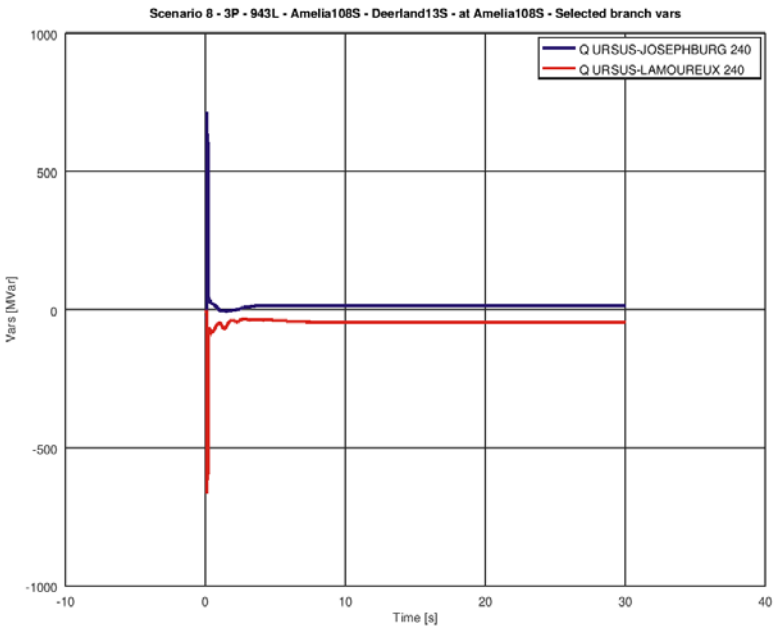


Figure A-1088 Scenario 8 - 3P - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

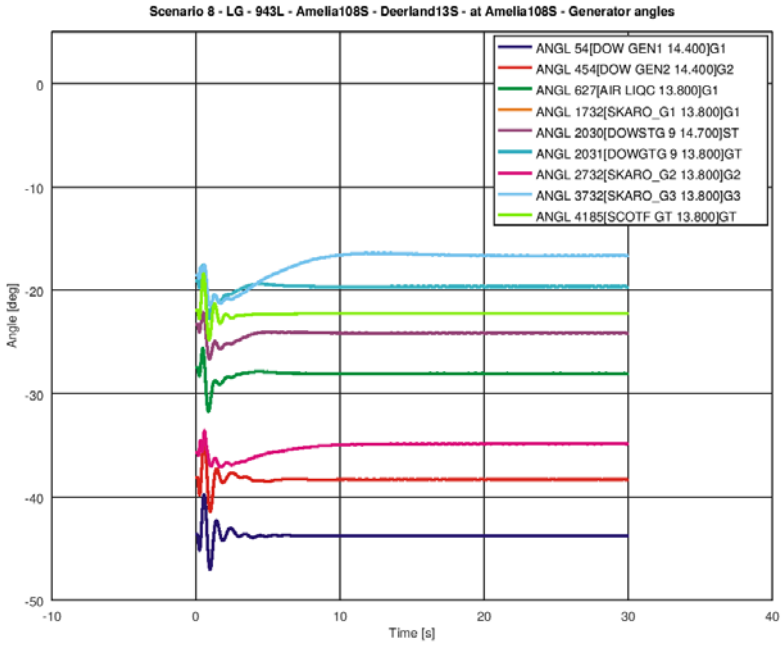


Figure A-1089 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

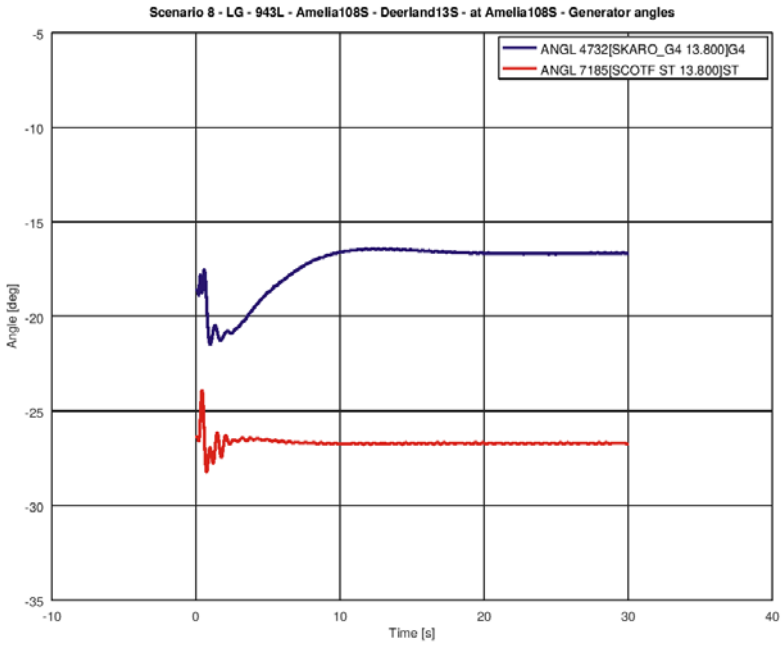


Figure A-1090 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator angles

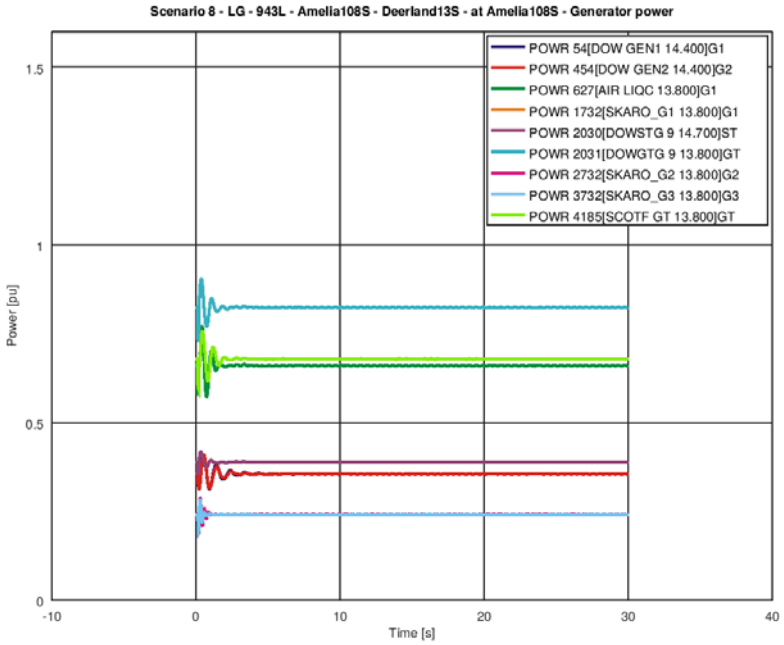


Figure A-1091 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

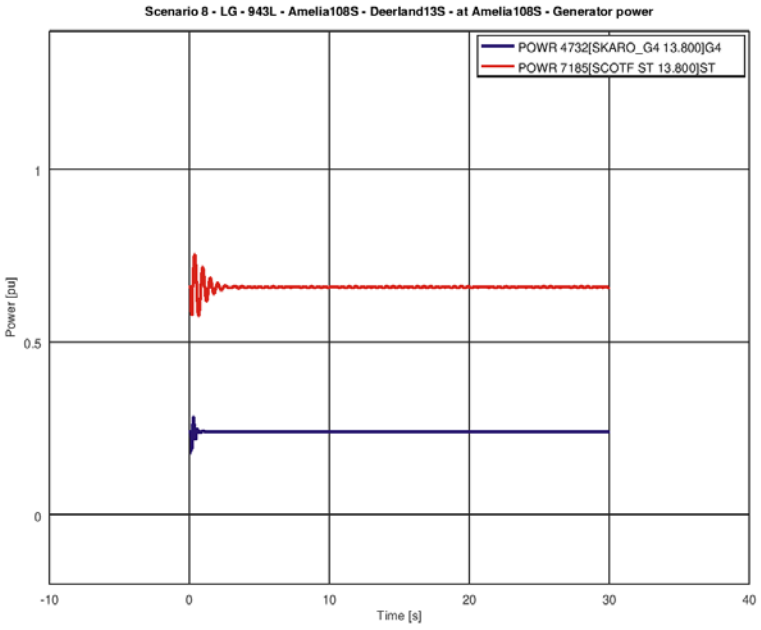


Figure A-1092 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator power

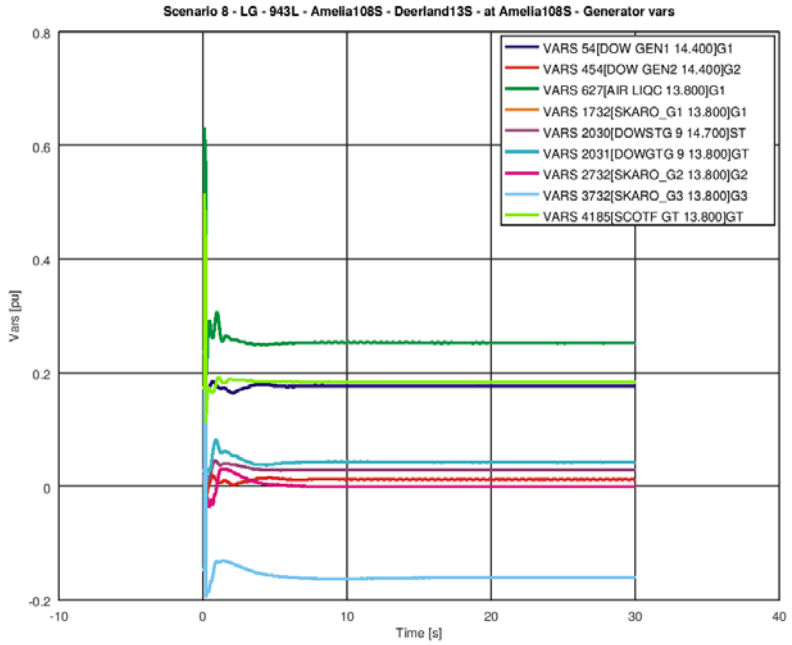


Figure A-1093 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

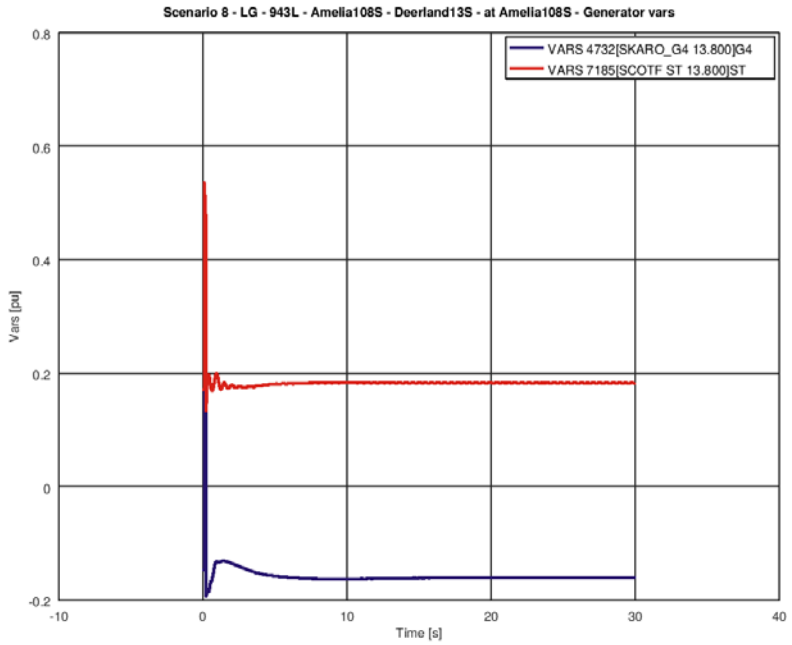


Figure A-1094 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Generator vars

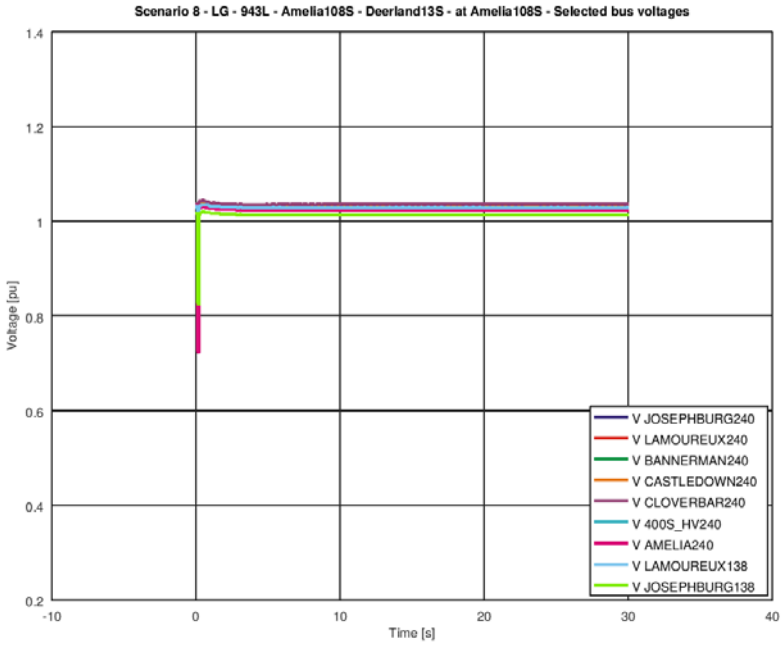


Figure A-1095 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

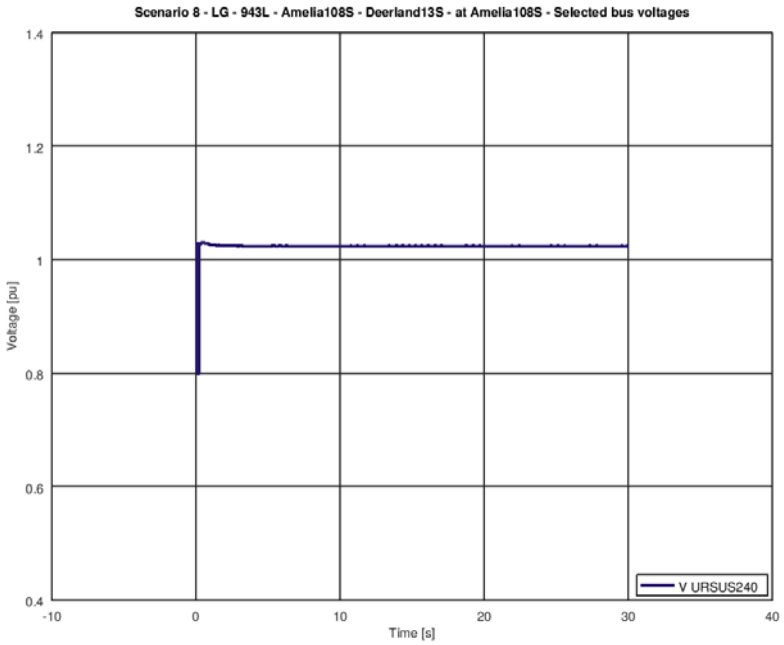


Figure A-1096 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected bus voltages

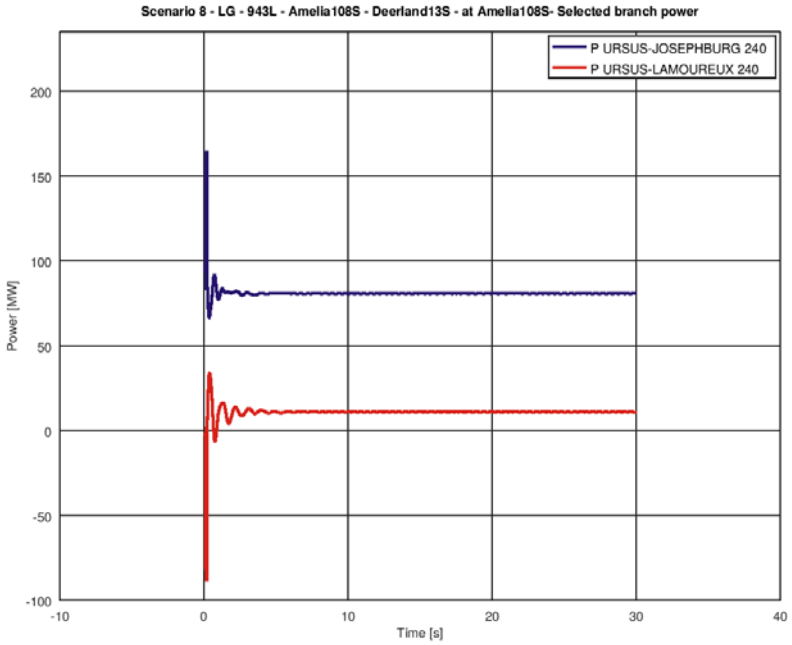


Figure A-1097 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch power

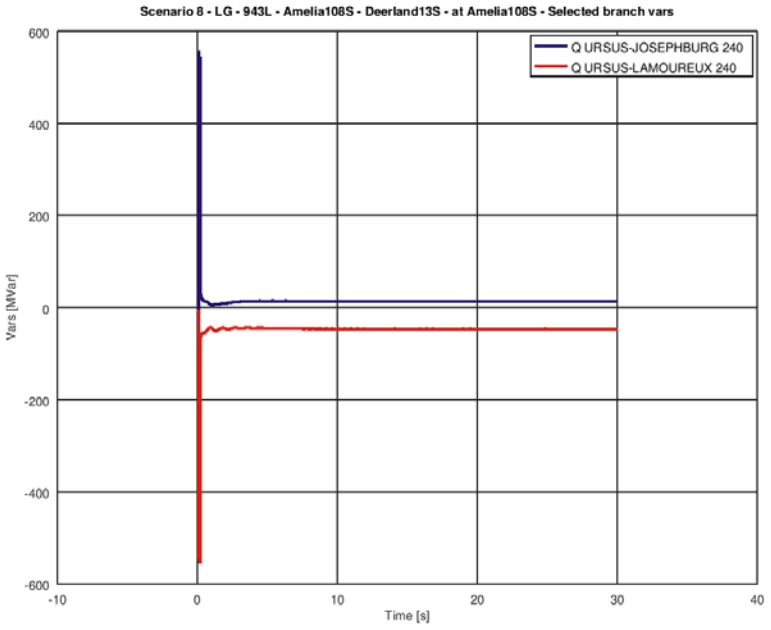


Figure A-1098 Scenario 8 - LG - 943L - Amelia108S - Deerland13S - at Amelia108S - Selected branch vars

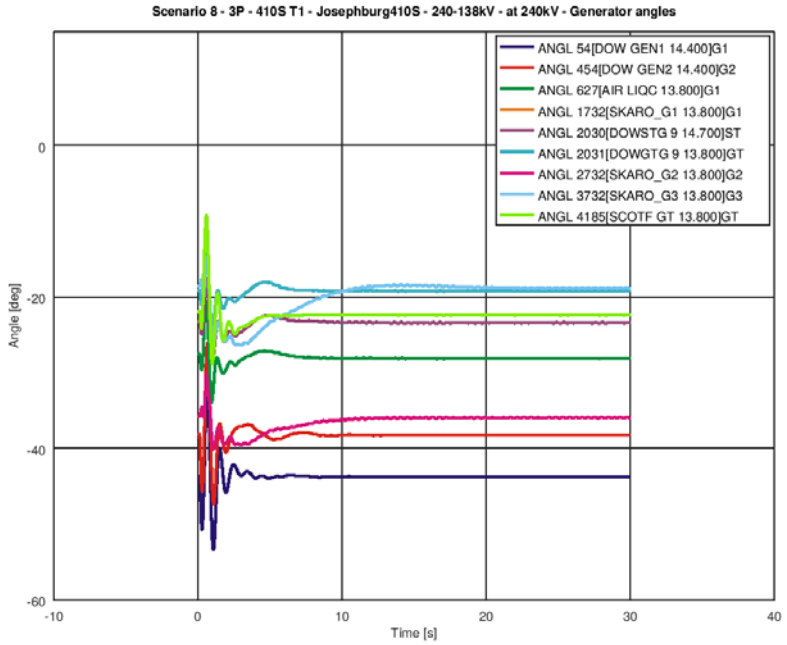


Figure A-1099 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

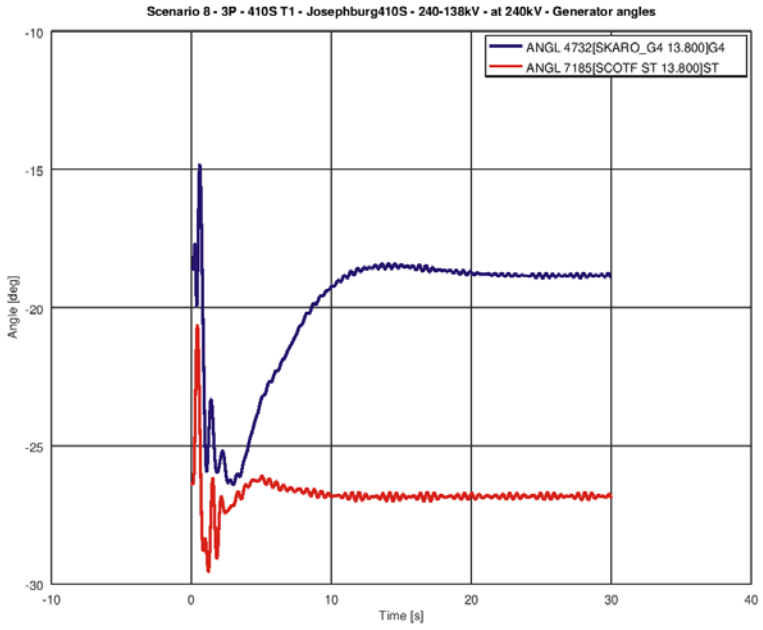


Figure A-1100 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

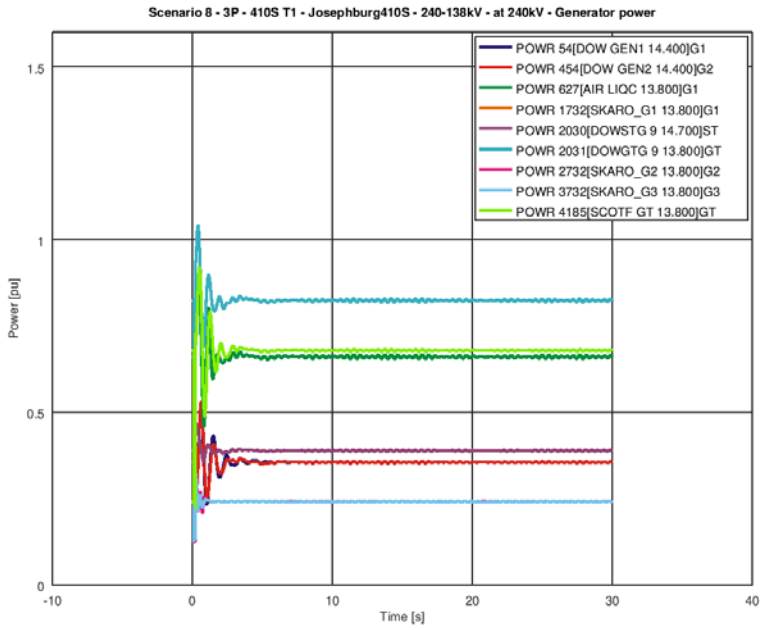


Figure A-1101 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

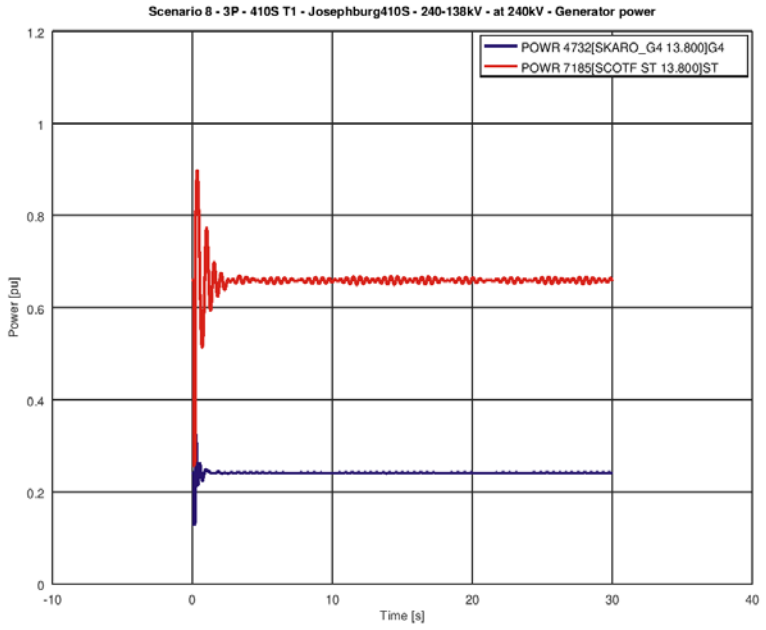


Figure A-1102 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

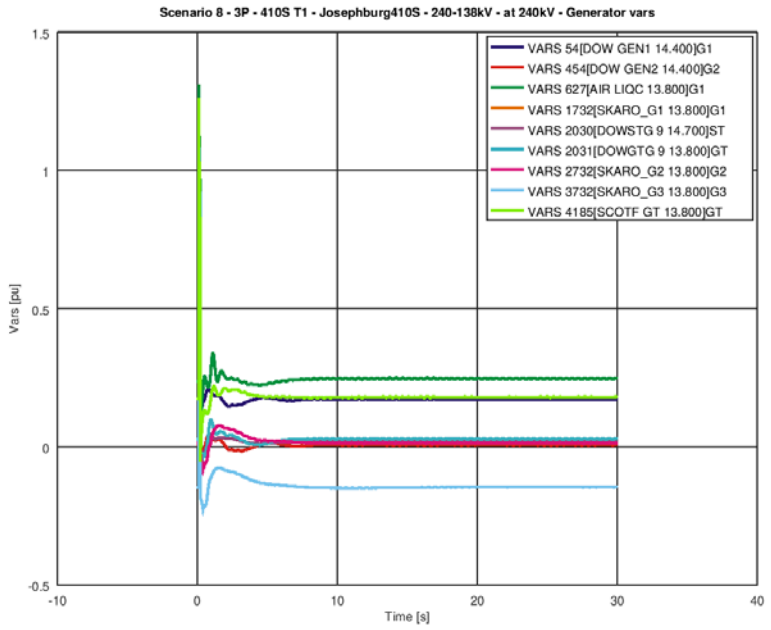


Figure A-1103 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

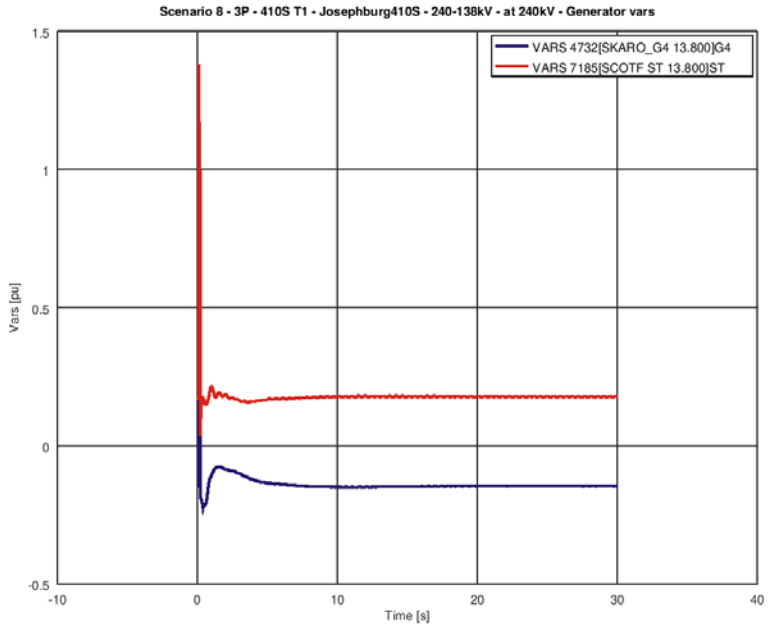


Figure A-1104 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

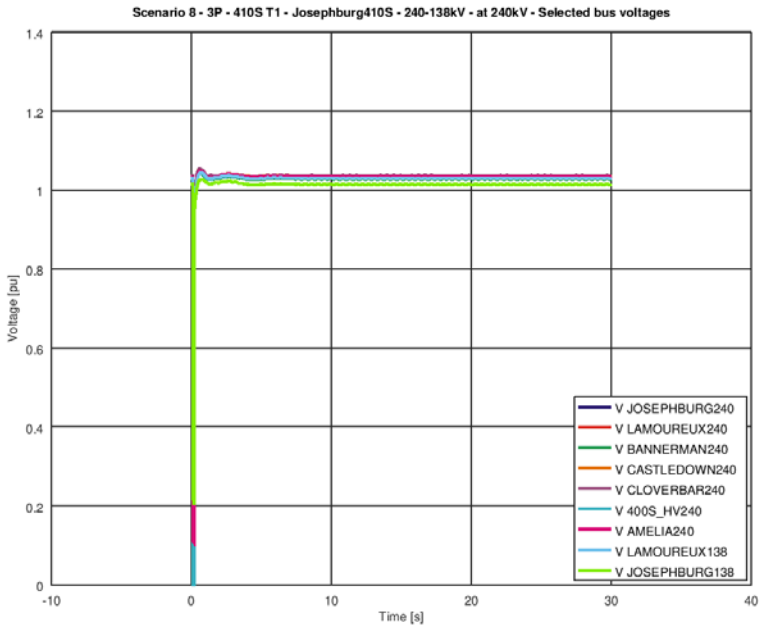


Figure A-1105 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

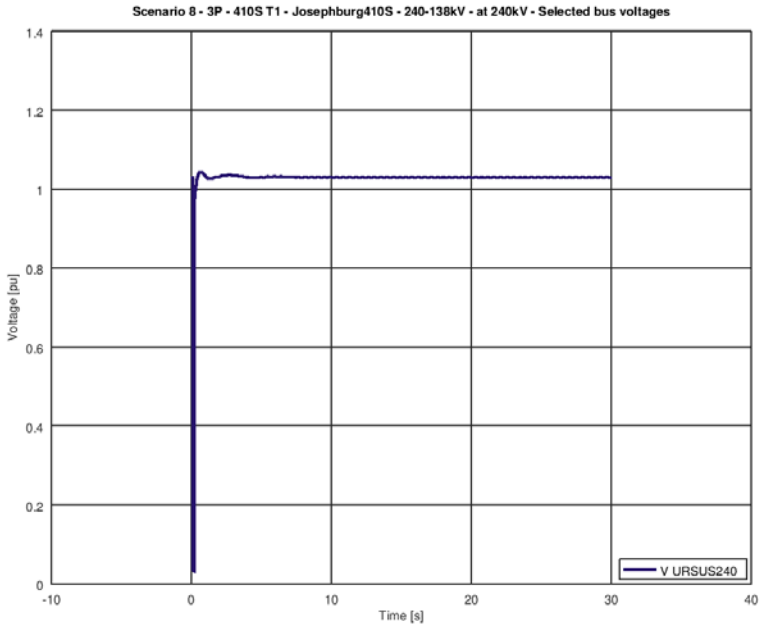


Figure A-1106 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

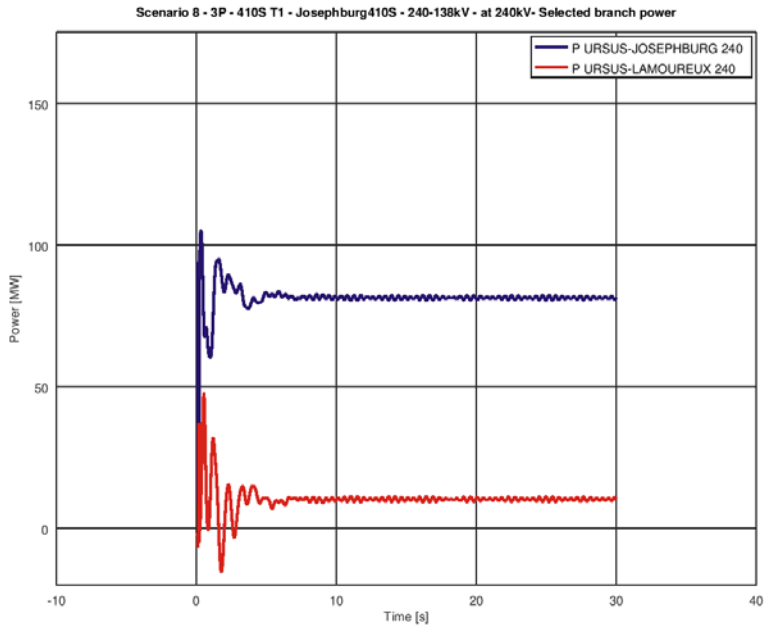


Figure A-1107 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch power

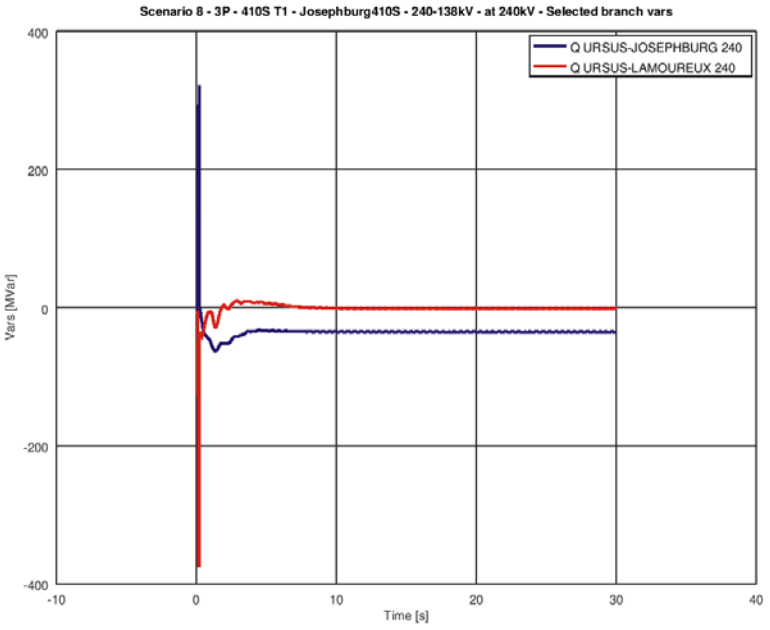


Figure A-1108 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch vars

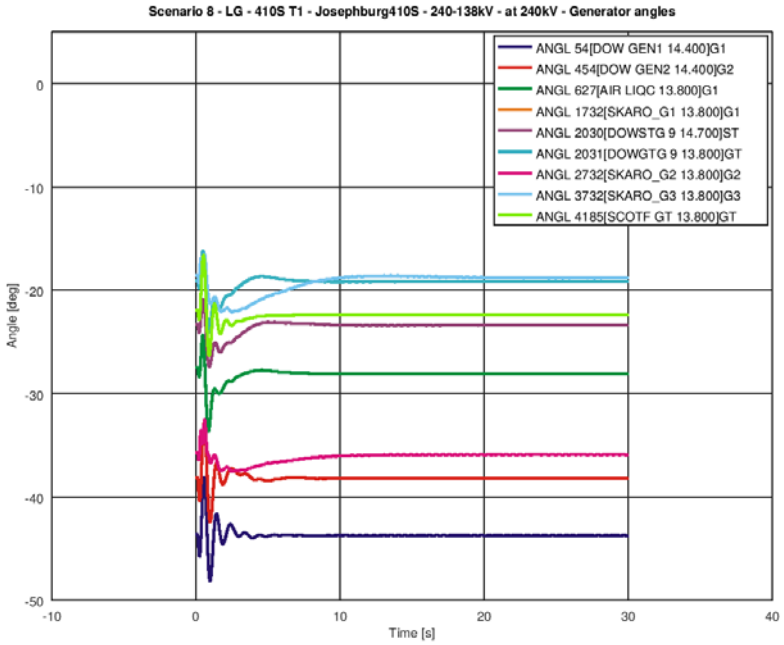


Figure A-1109 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

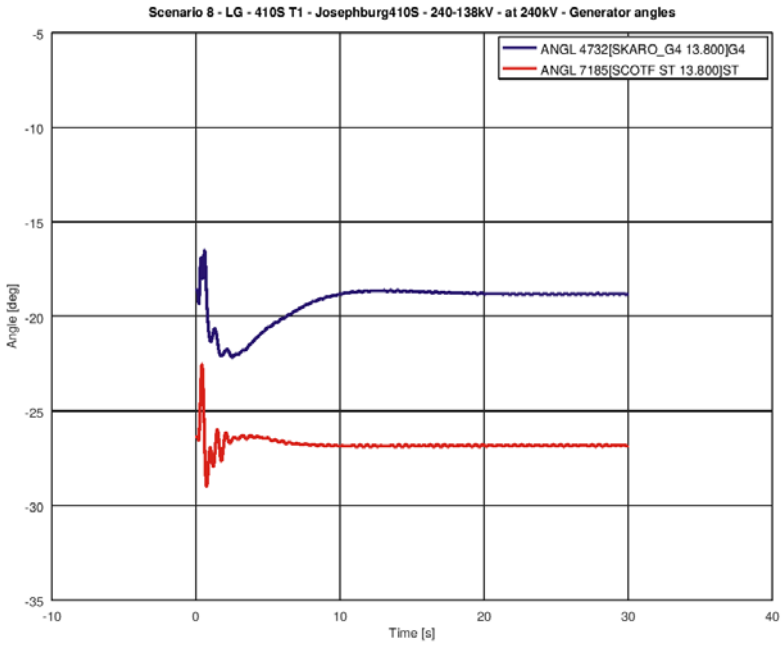


Figure A-1110 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator angles

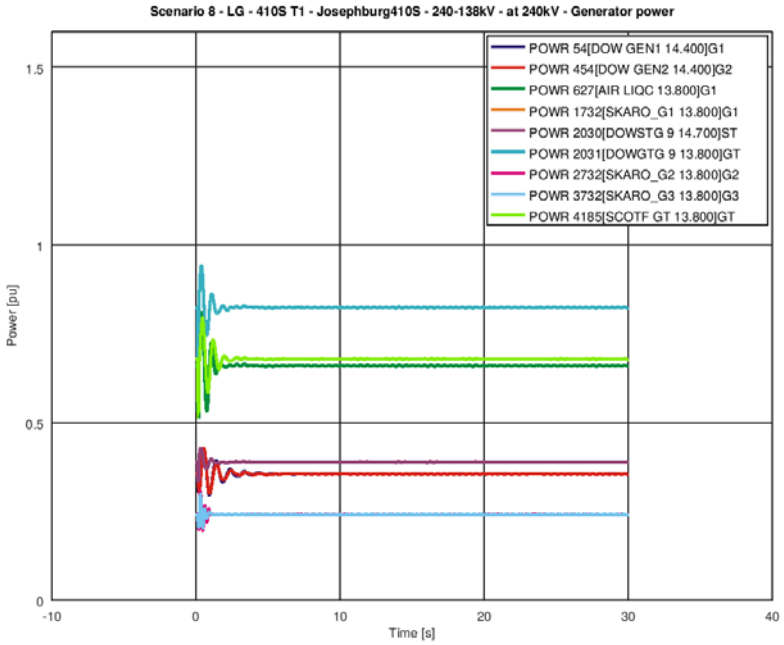


Figure A-1111 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

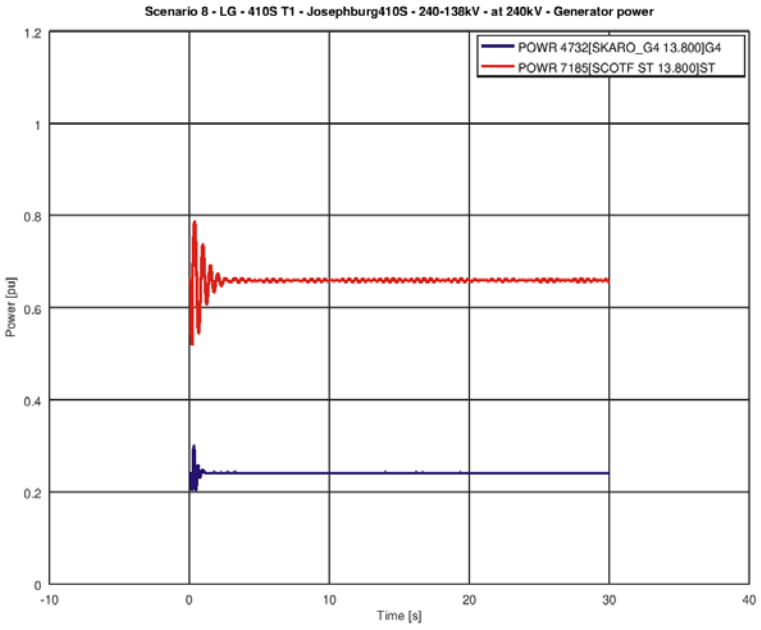


Figure A-1112 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator power

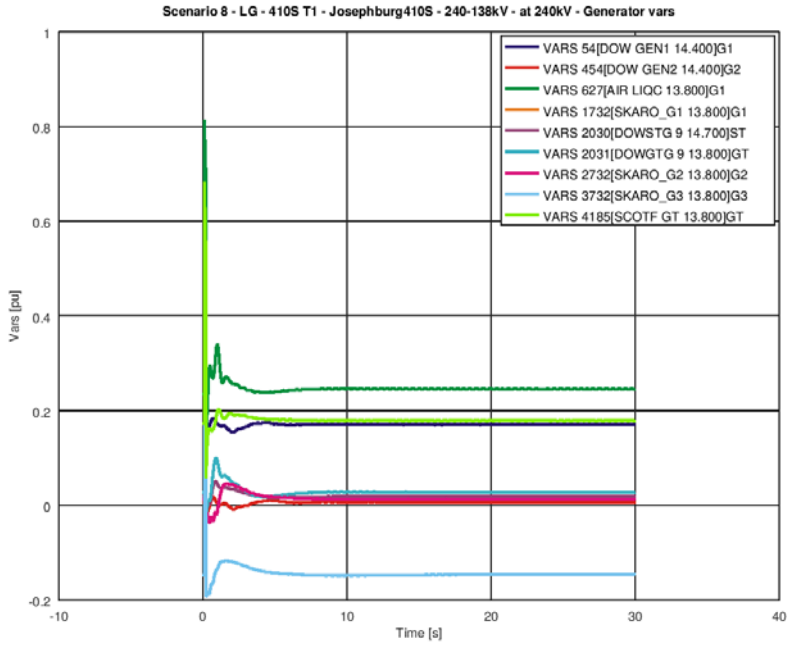


Figure A-1113 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

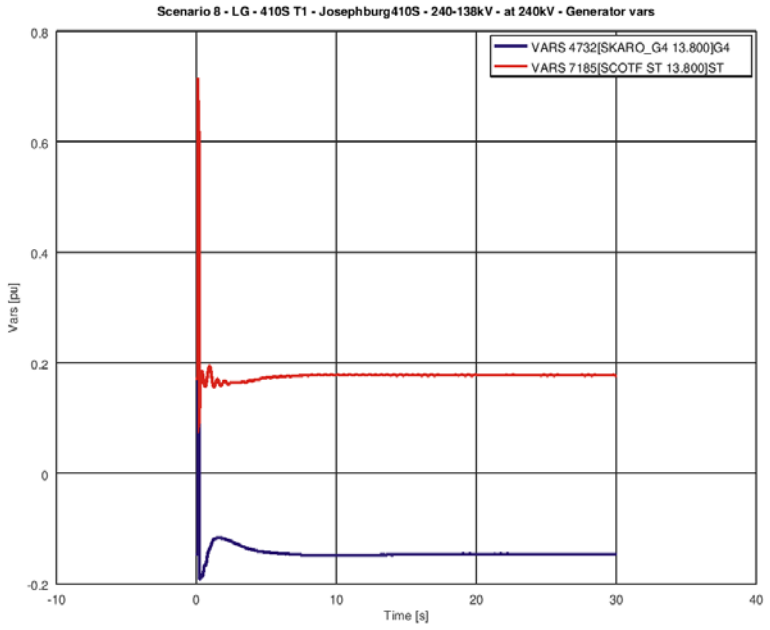


Figure A-1114 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Generator vars

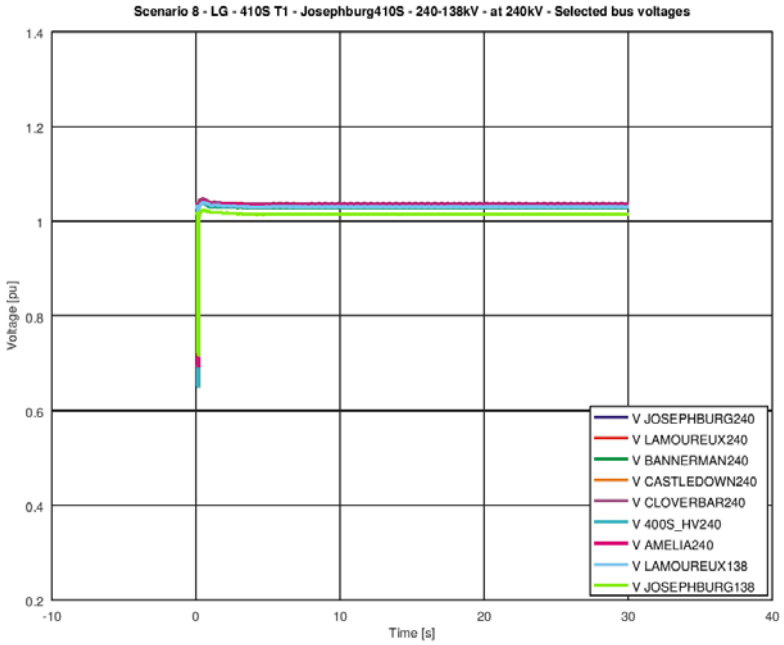


Figure A-1115 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

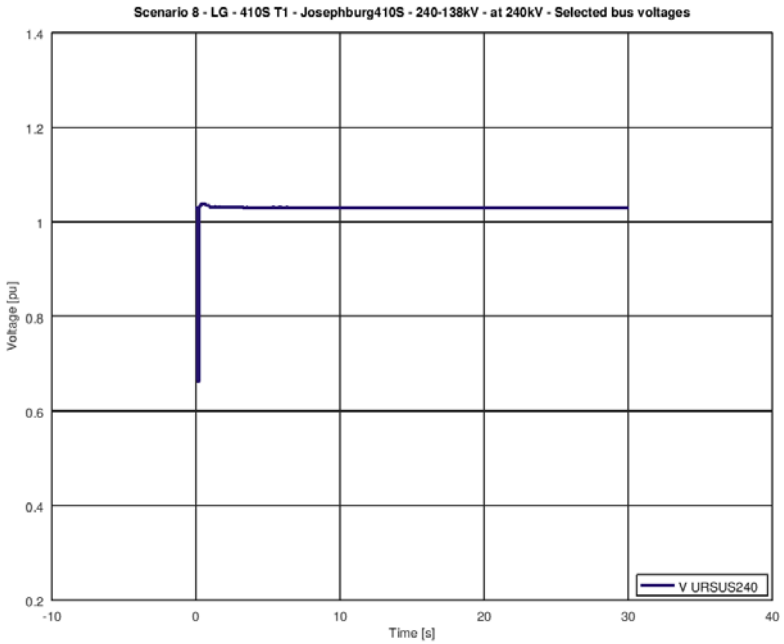


Figure A-1116 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected bus voltages

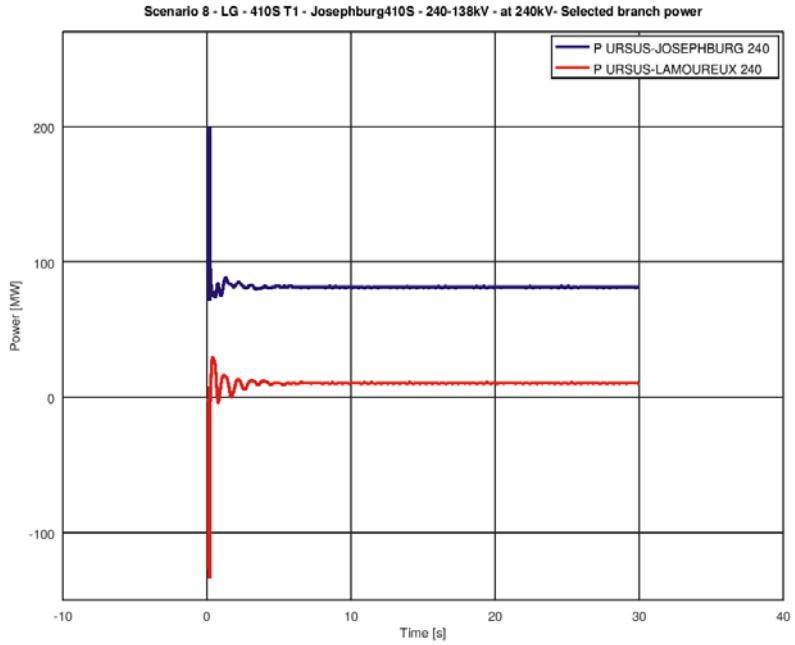


Figure A-1117 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch power

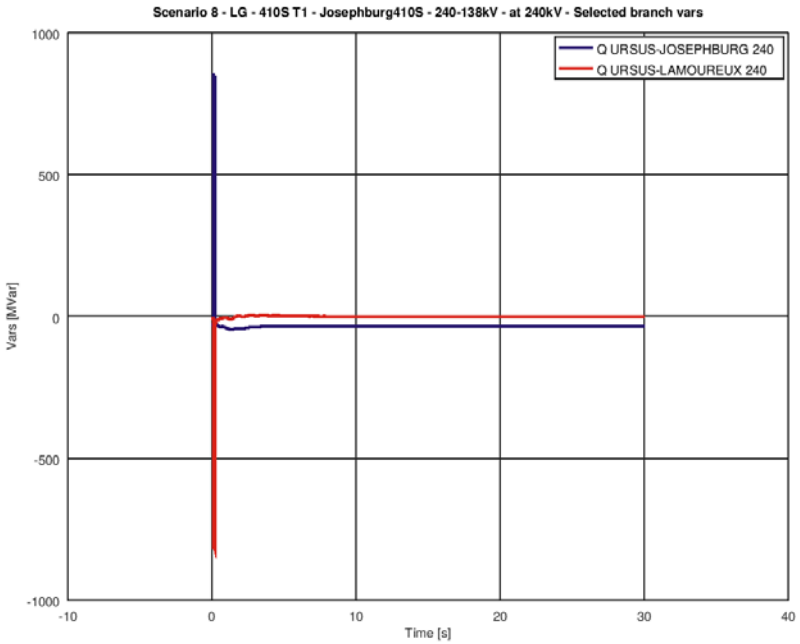


Figure A-1118 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 240kV - Selected branch vars

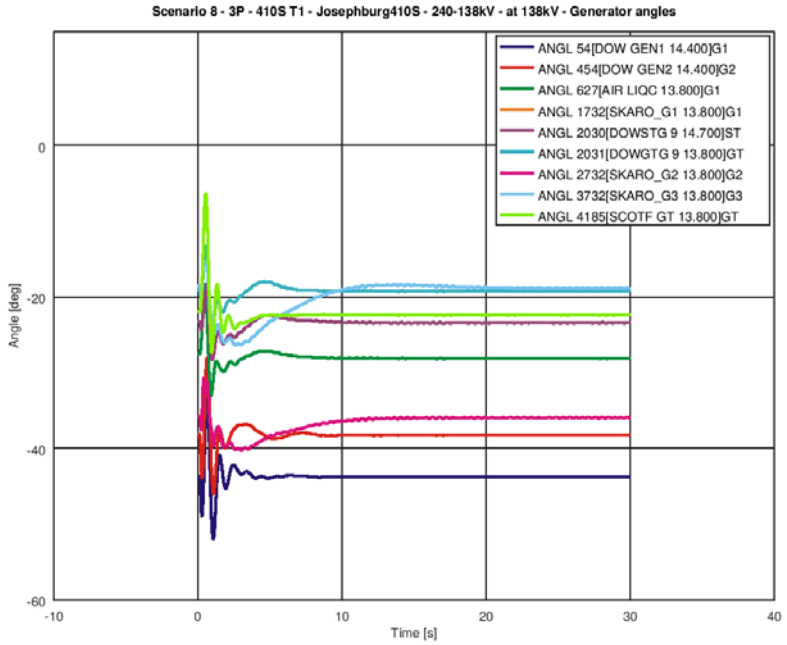


Figure A-1119 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

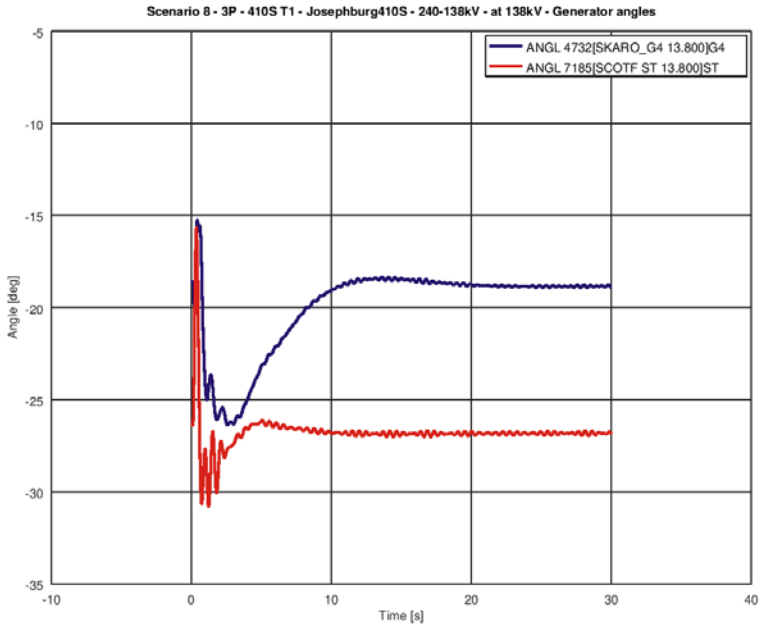


Figure A-1120 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

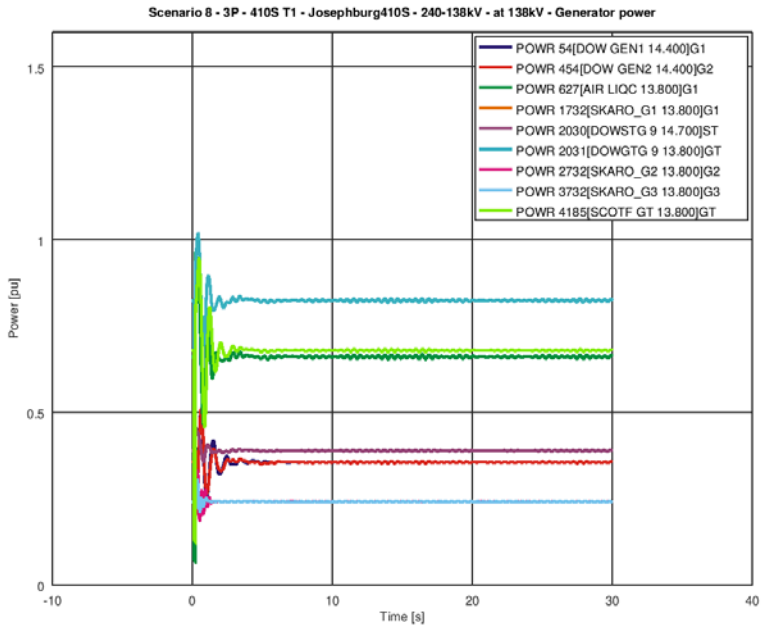


Figure A-1121 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

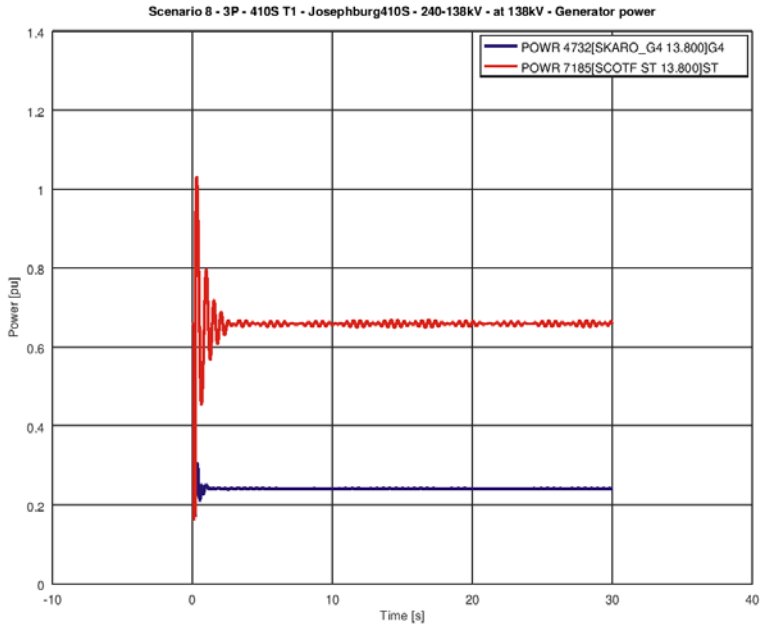


Figure A-1122 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

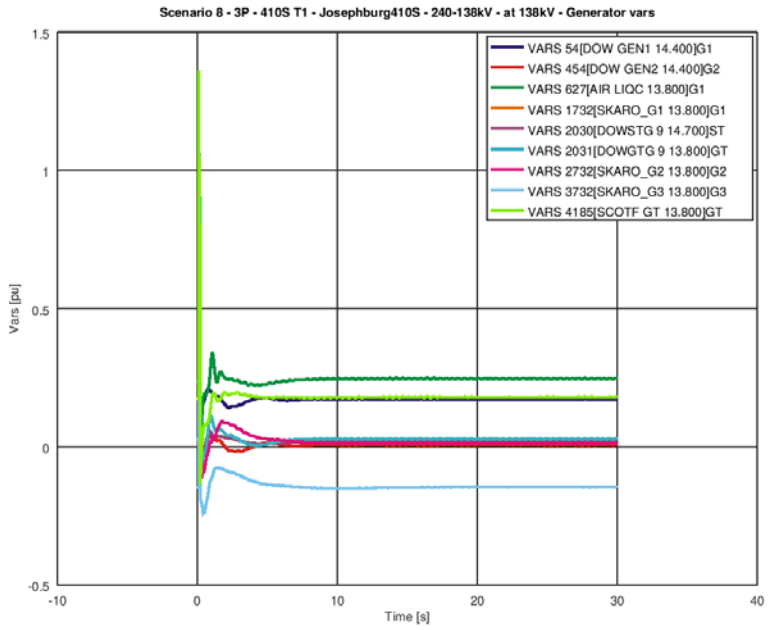


Figure A-1123 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

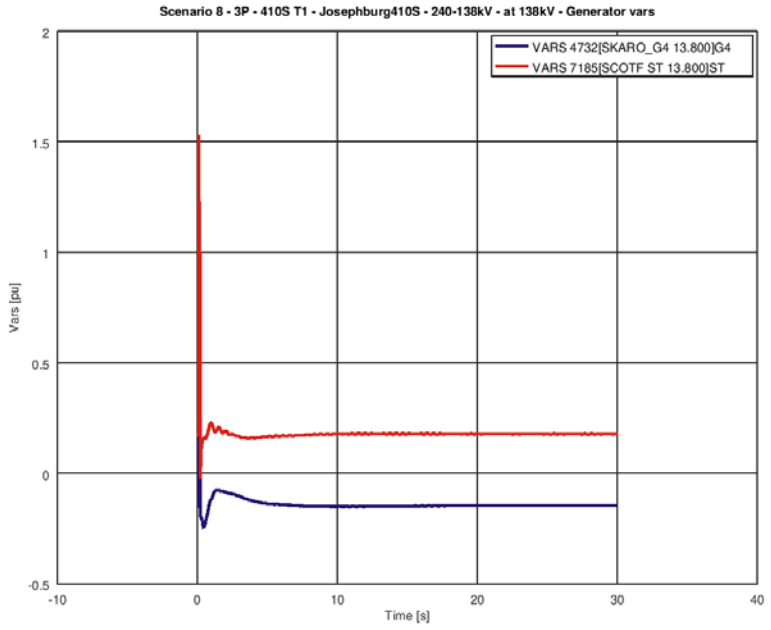


Figure A-1124 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

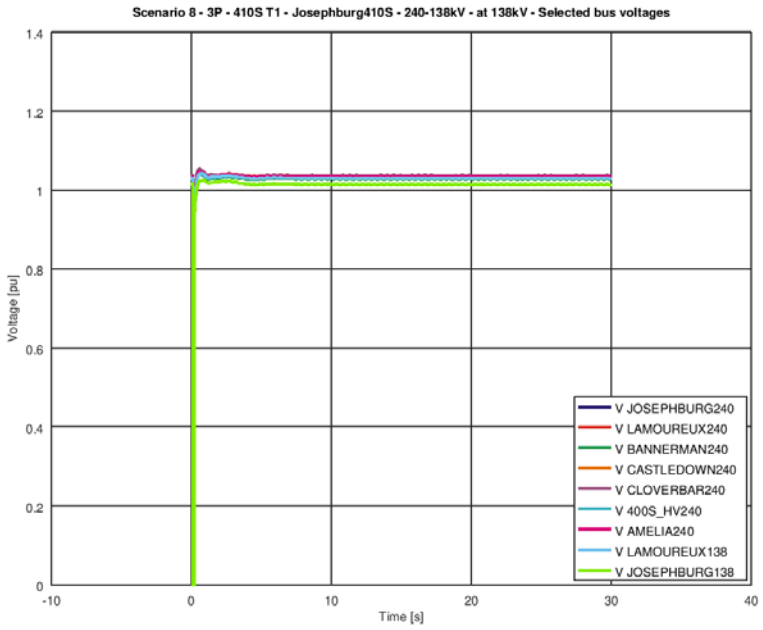


Figure A-1125 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

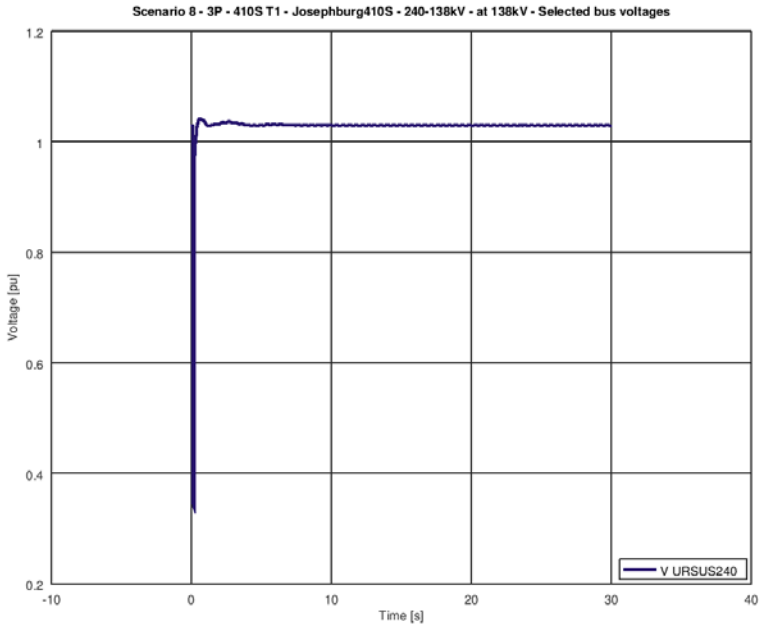


Figure A-1126 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

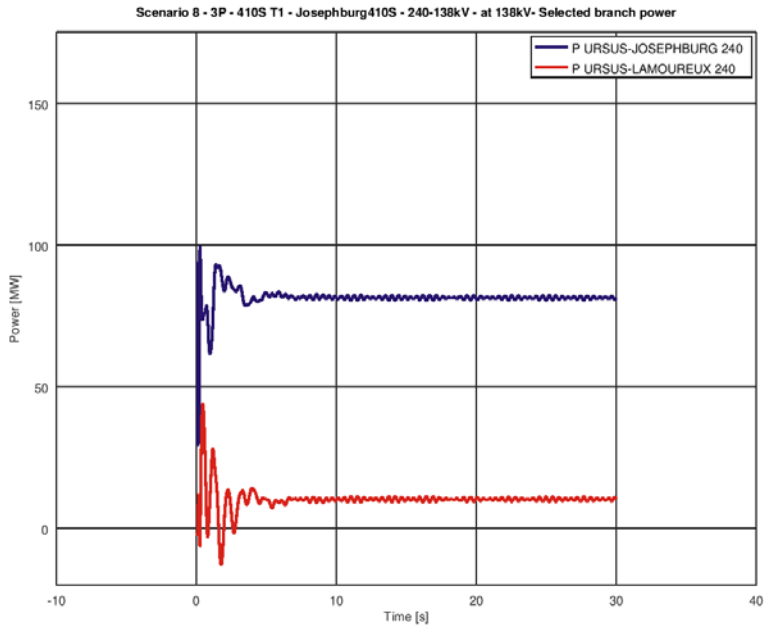


Figure A-1127 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch power

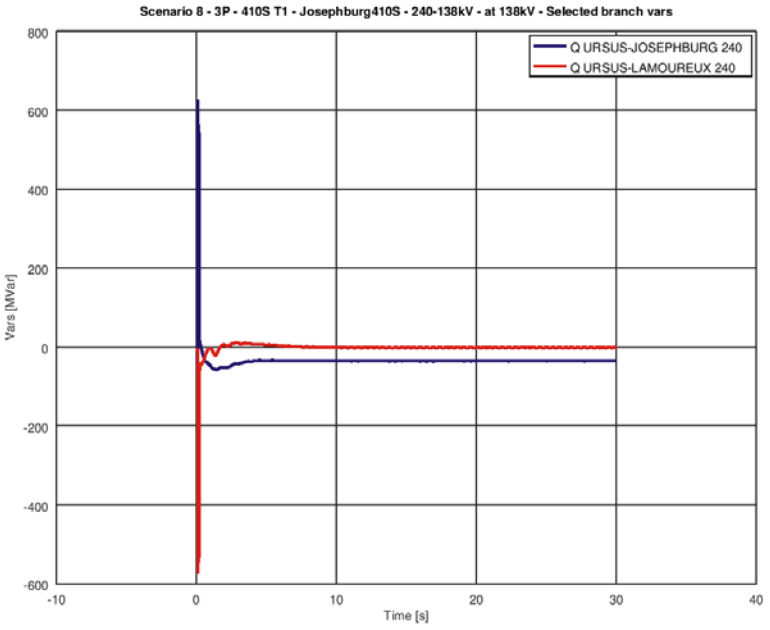


Figure A-1128 Scenario 8 - 3P - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch vars

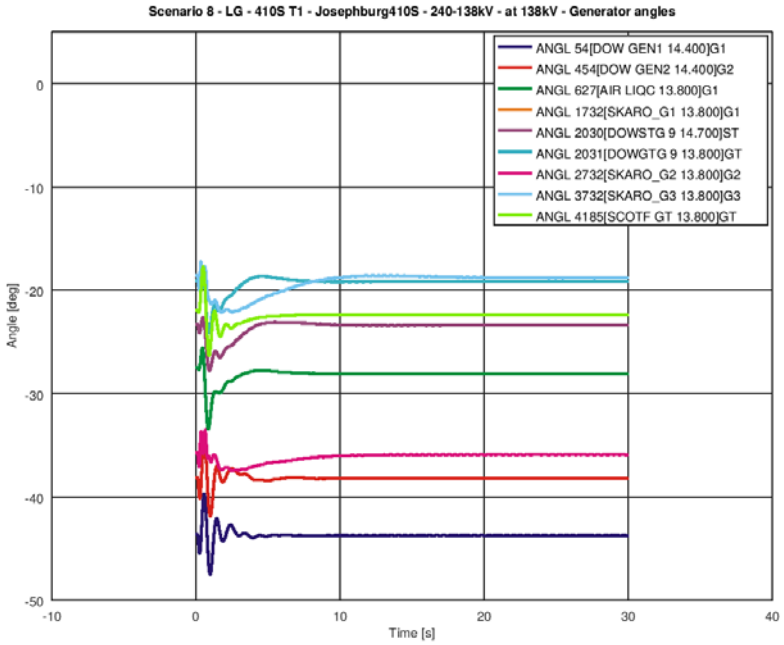


Figure A-1129 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

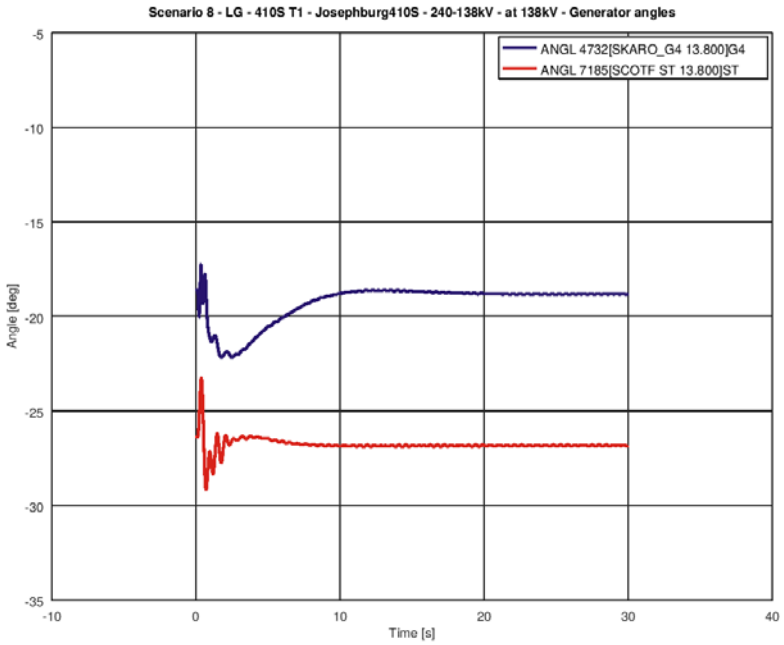


Figure A-1130 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator angles

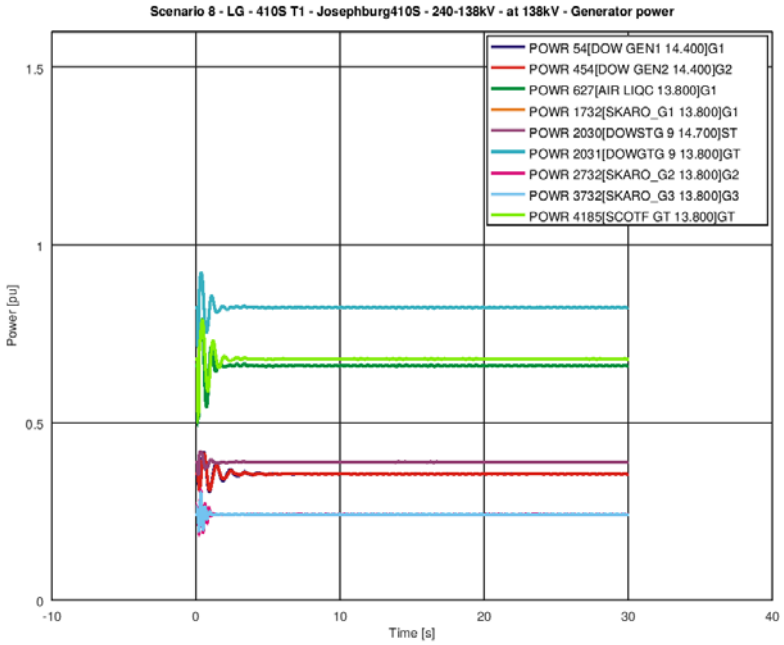


Figure A-1131 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

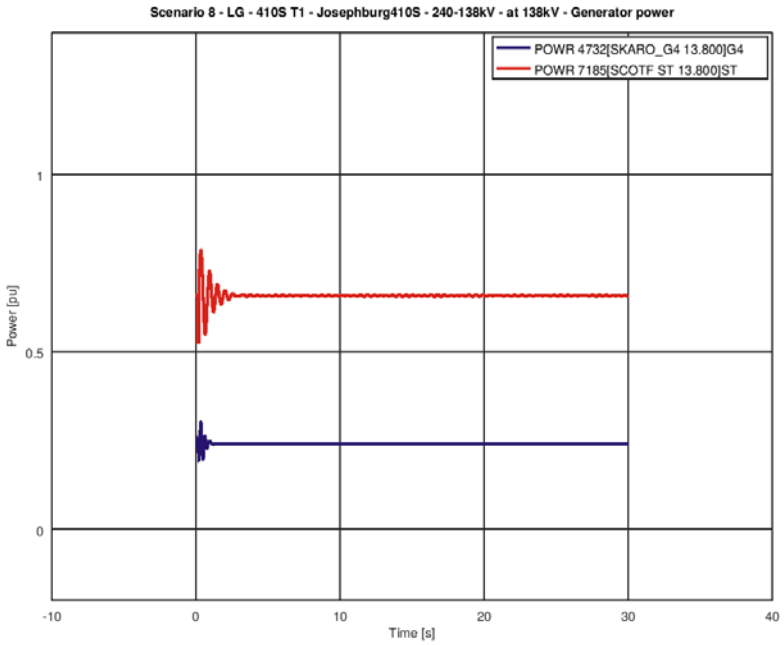


Figure A-1132 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator power

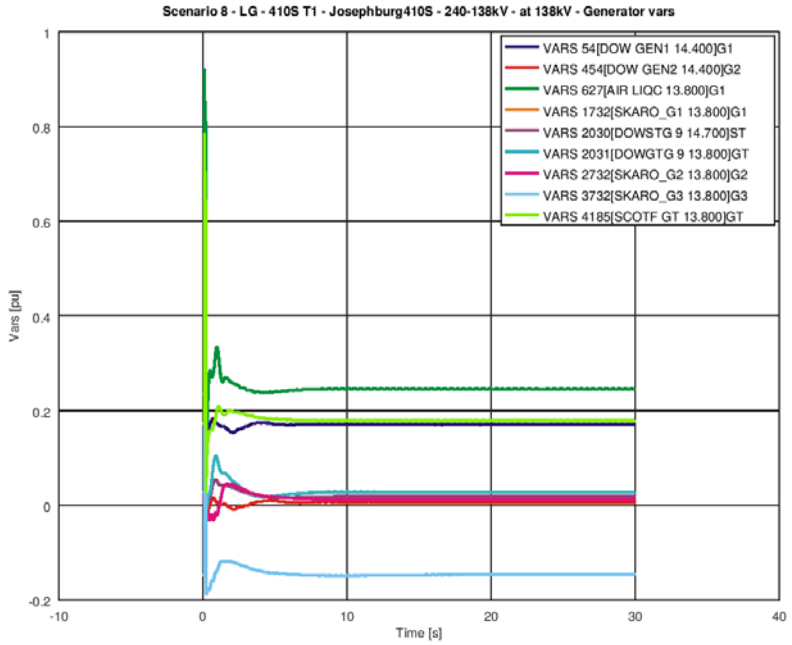


Figure A-1133 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

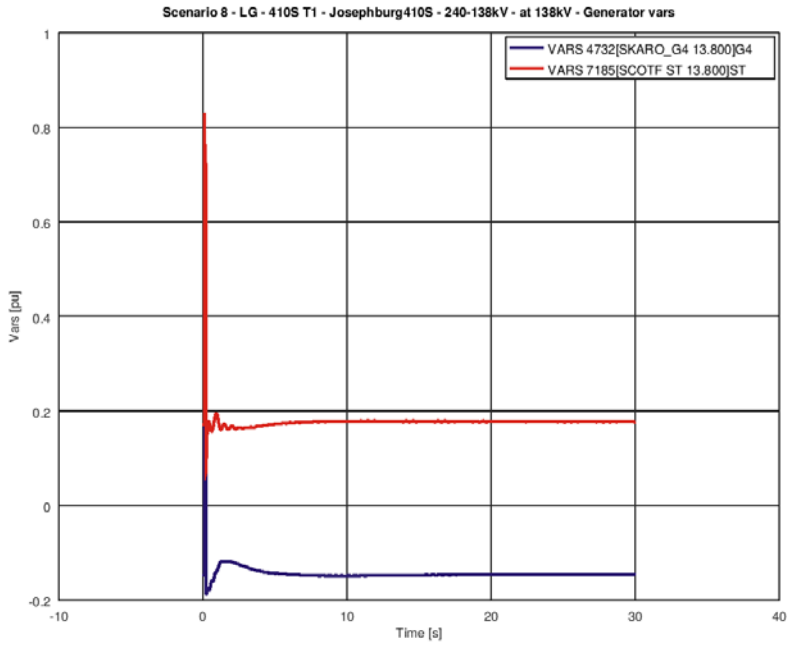


Figure A-1134 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Generator vars

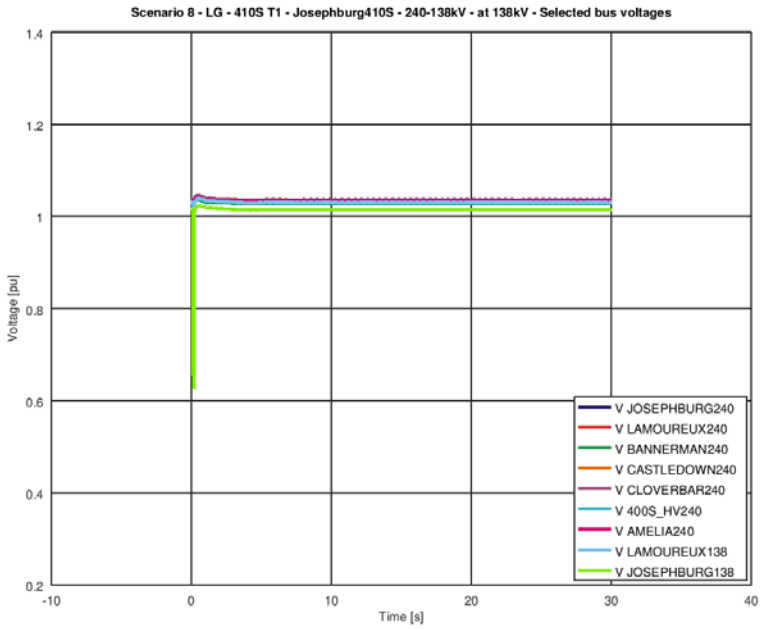


Figure A-1135 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

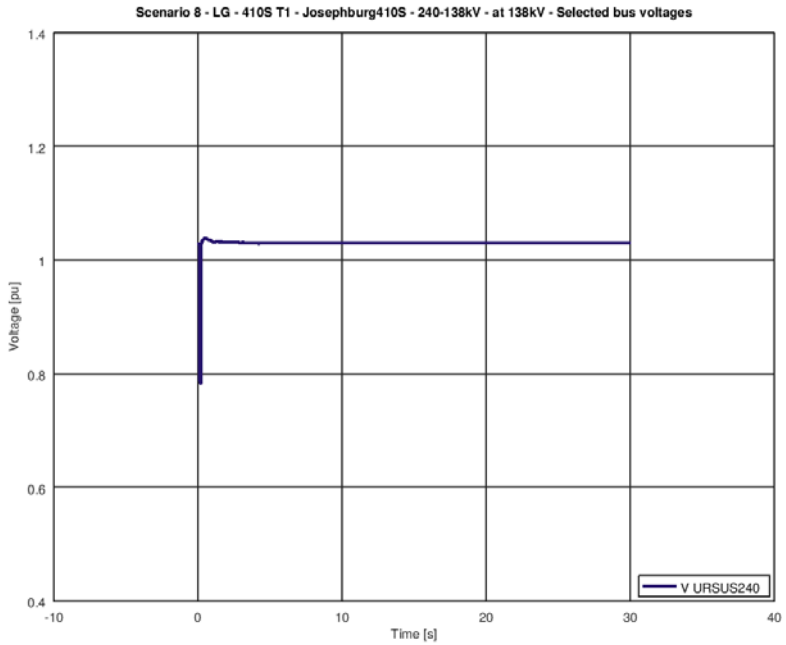


Figure A-1136 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected bus voltages

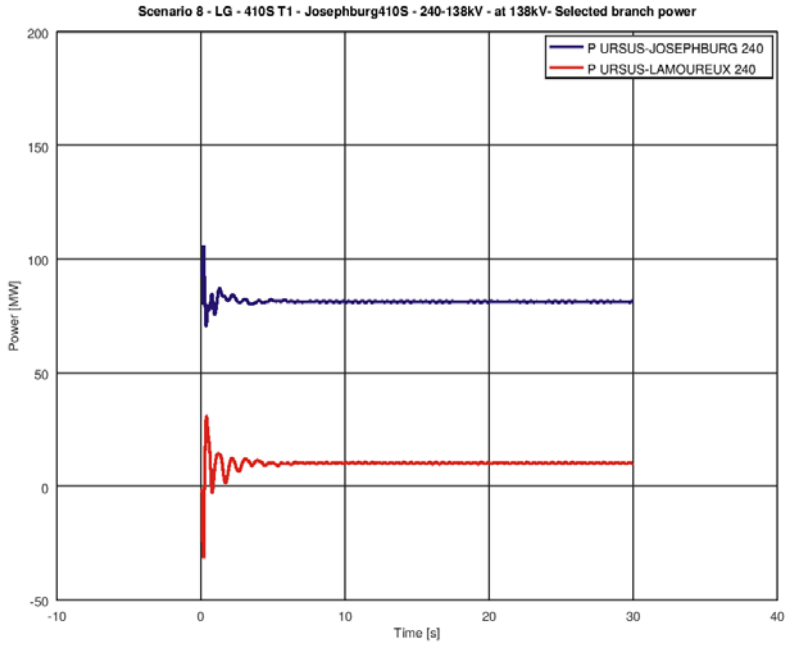


Figure A-1137 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch power

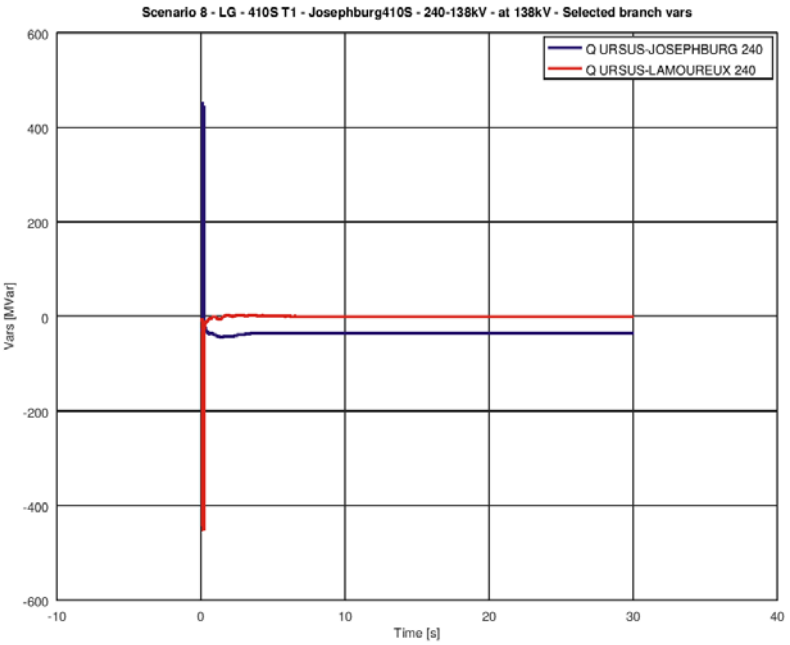


Figure A-1138 Scenario 8 - LG - 410S T1 - Josephburg410S - 240-138kV - at 138kV - Selected branch vars

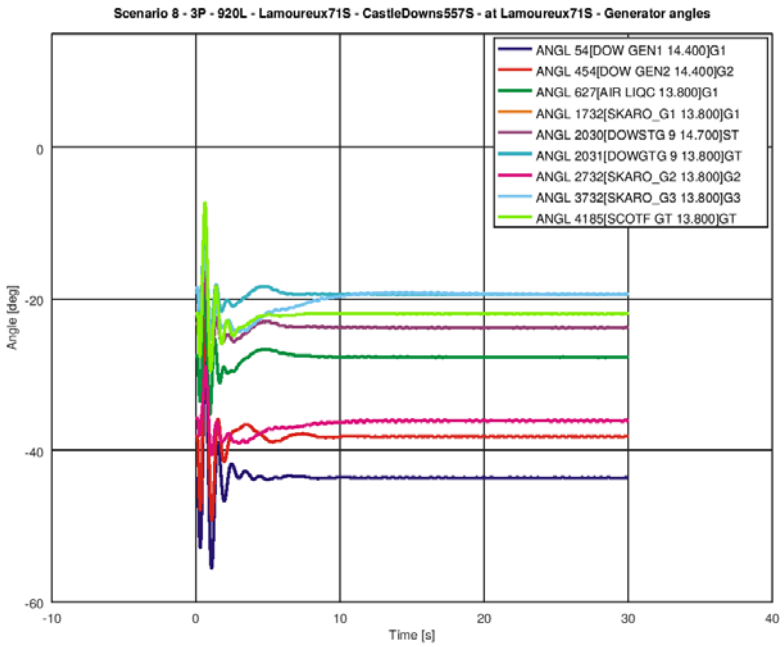


Figure A-1139 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

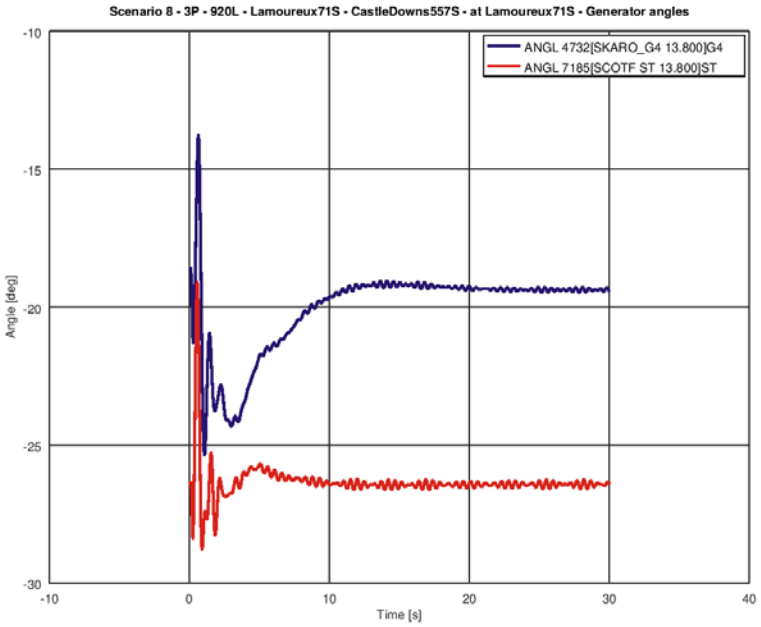


Figure A-1140 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

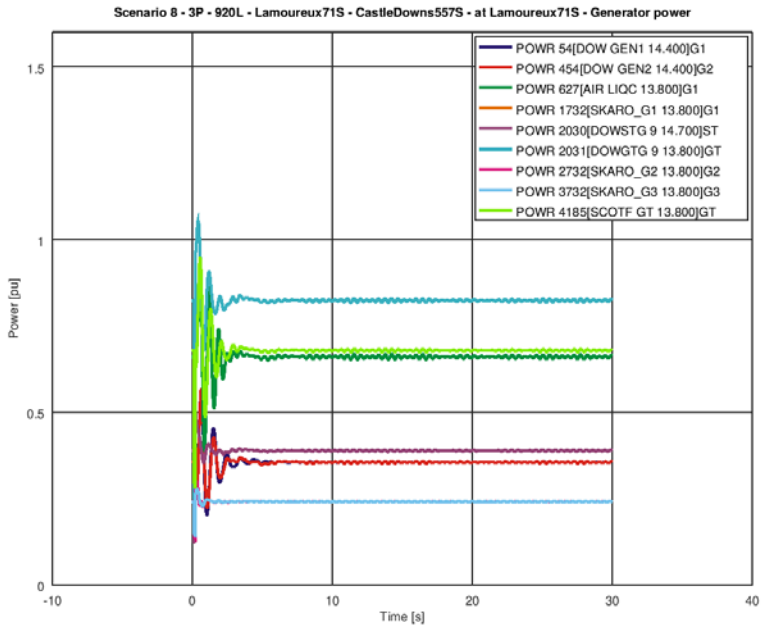


Figure A-1141 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

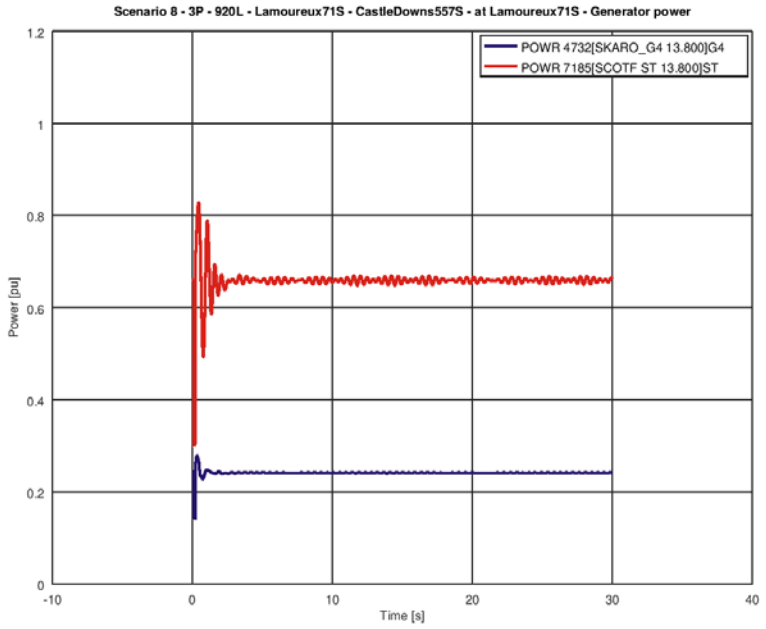


Figure A-1142 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

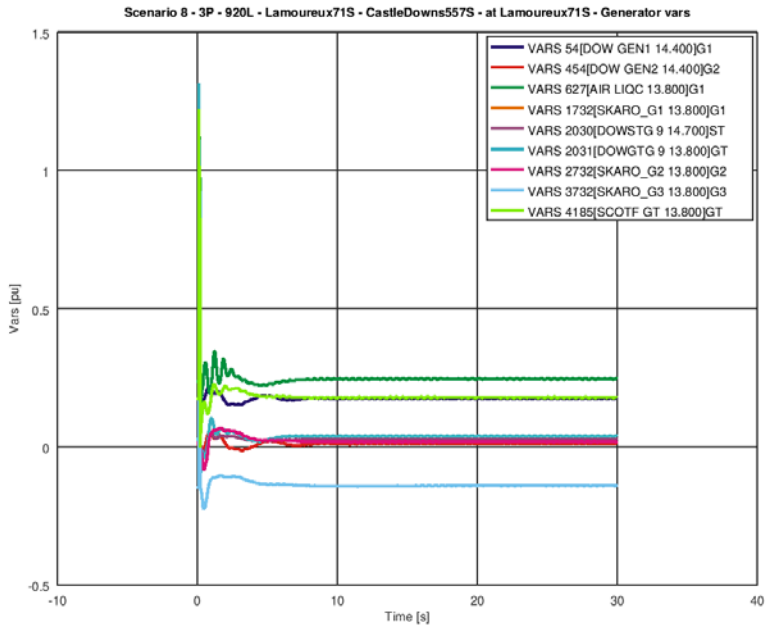


Figure A-1143 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

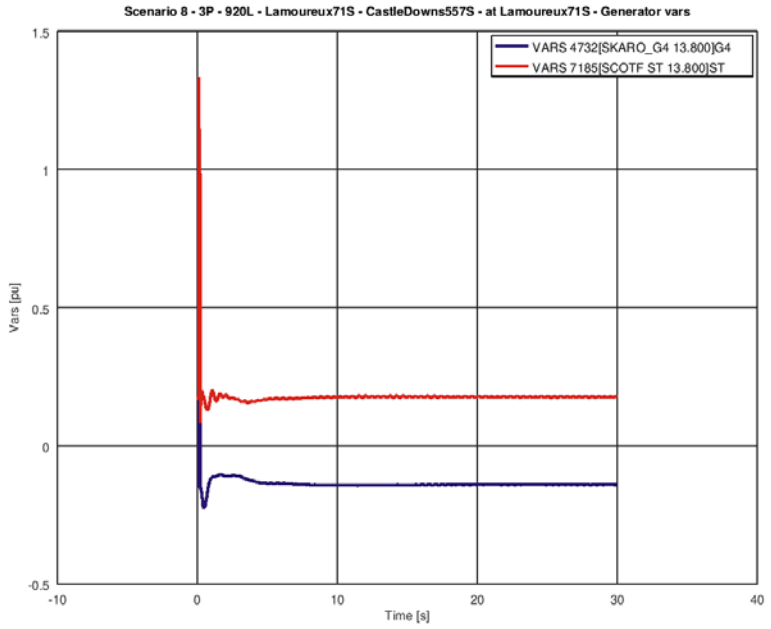


Figure A-1144 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

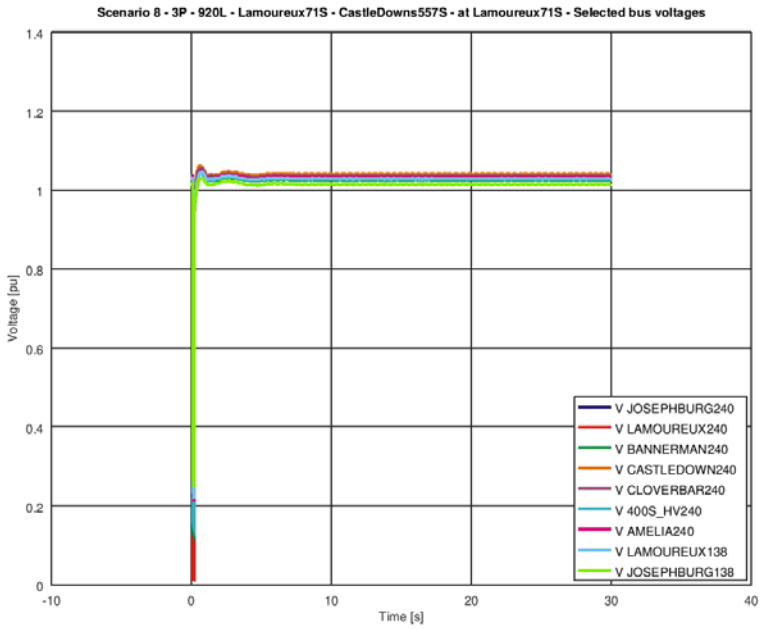


Figure A-1145 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

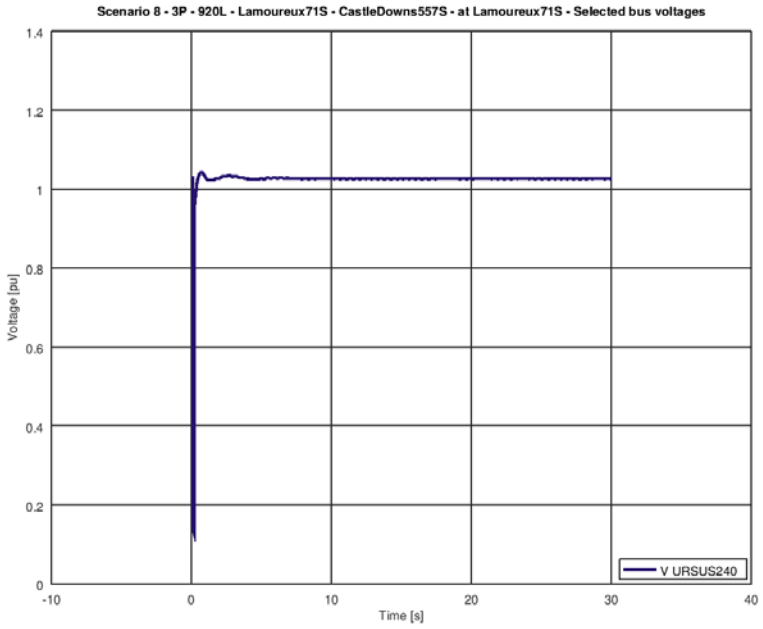


Figure A-1146 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

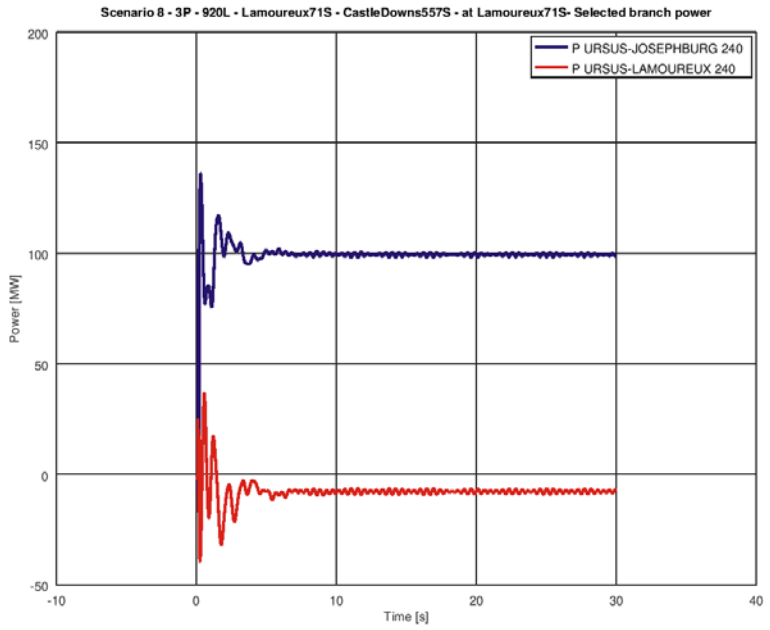


Figure A-1147 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

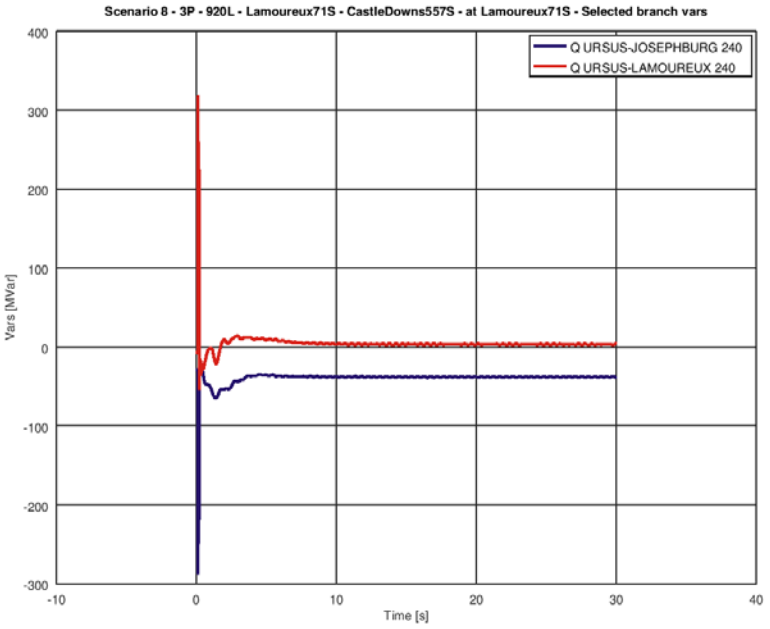


Figure A-1148 Scenario 8 - 3P - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

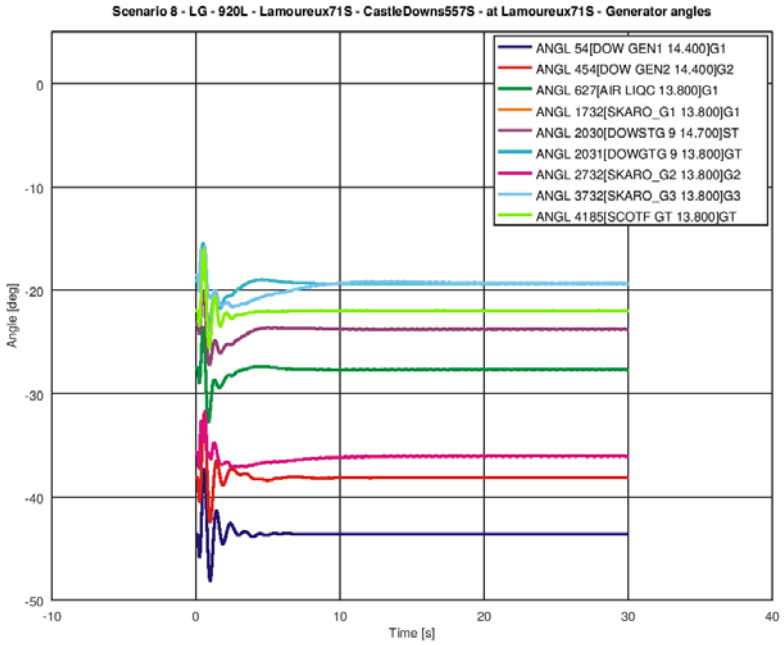


Figure A-1149 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

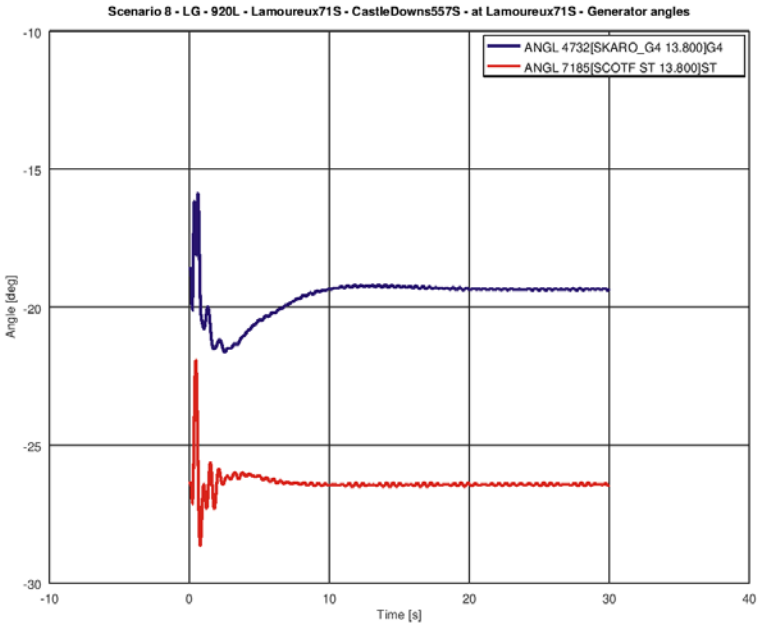


Figure A-1150 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator angles

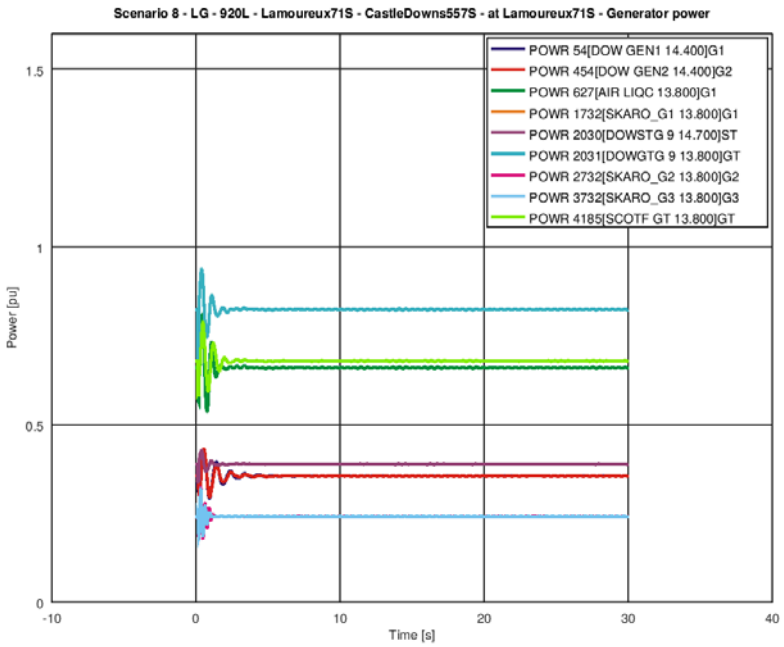


Figure A-1151 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

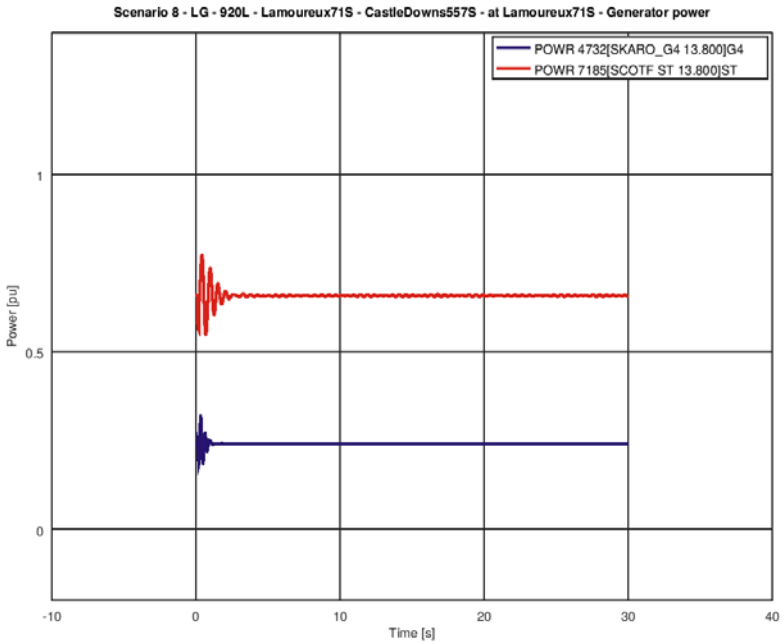


Figure A-1152 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator power

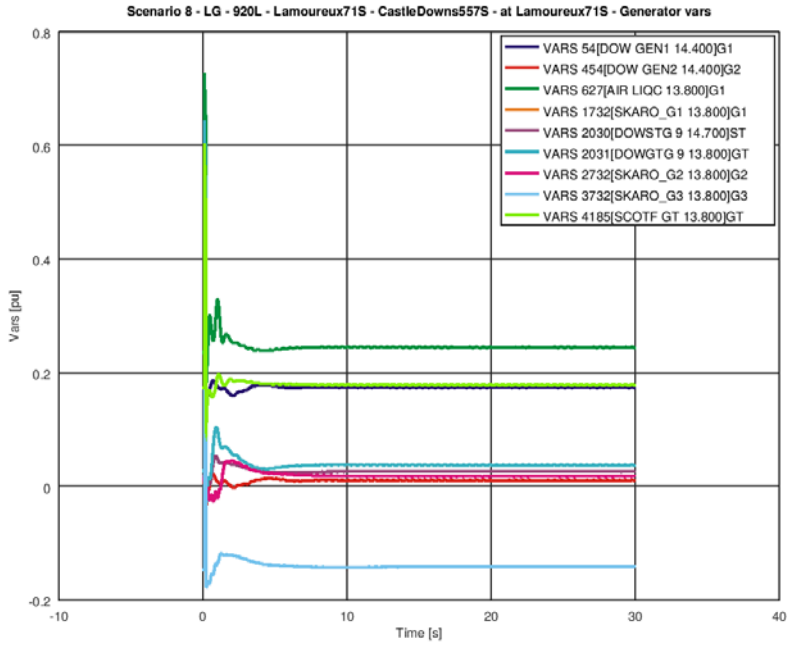


Figure A-1153 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

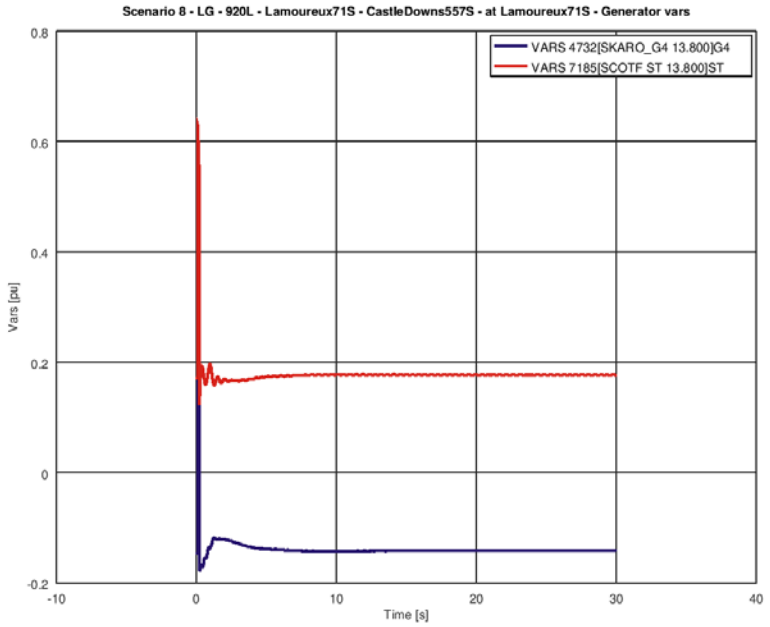


Figure A-1154 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Generator vars

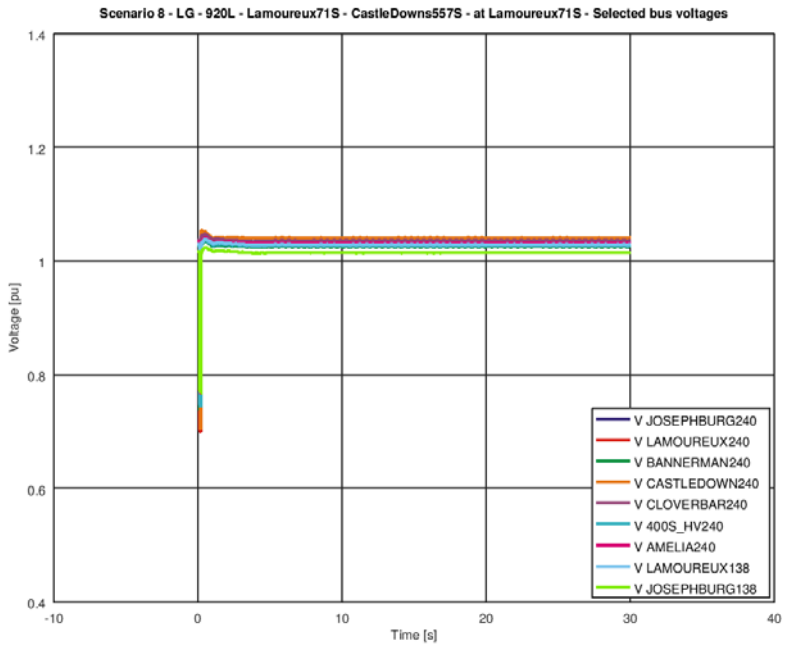


Figure A-1155 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

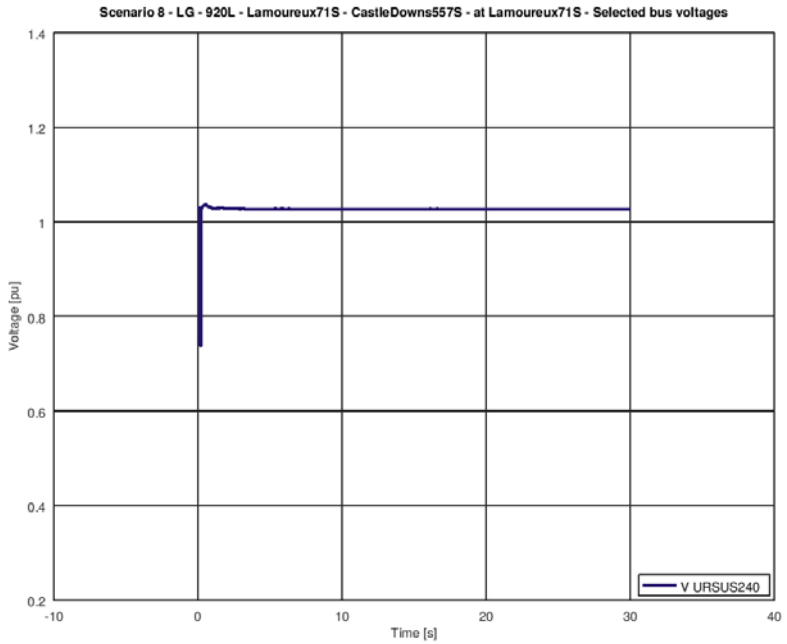


Figure A-1156 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected bus voltages

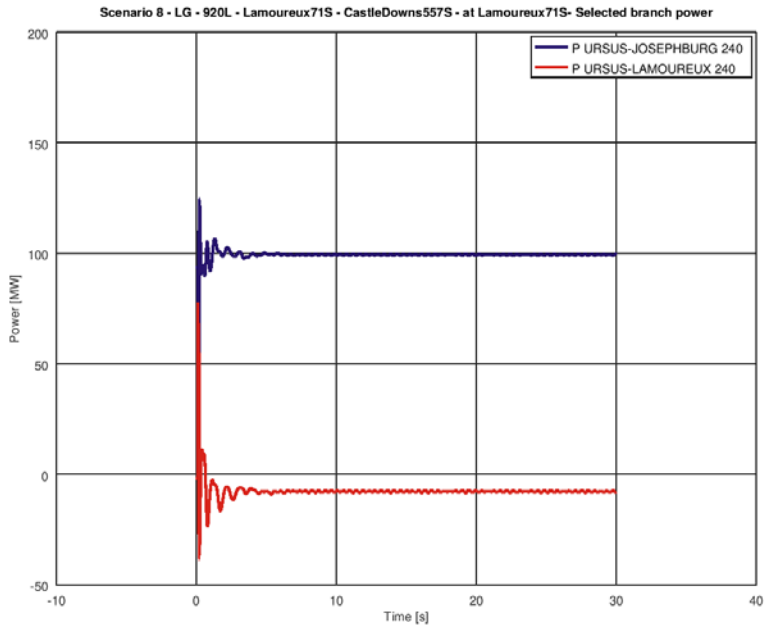


Figure A-1157 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch power

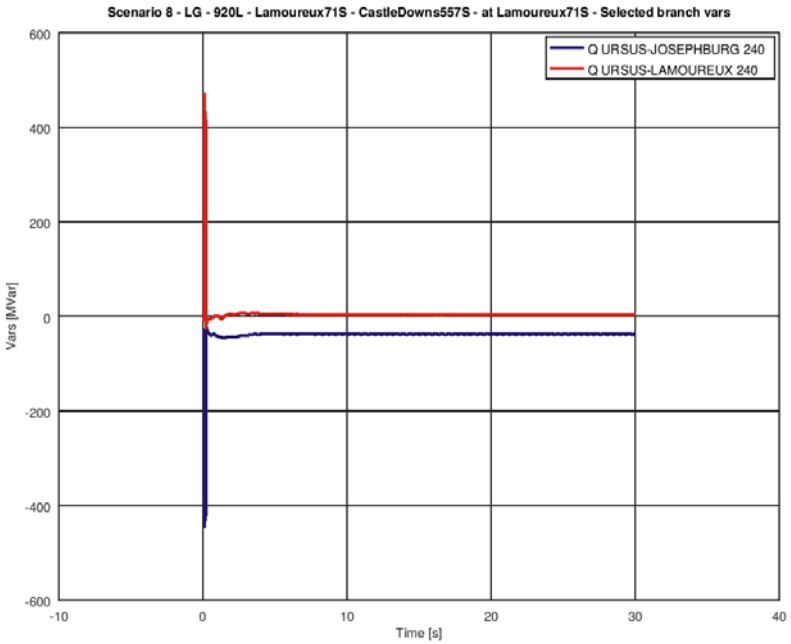


Figure A-1158 Scenario 8 - LG - 920L - Lamoureux71S - CastleDowns557S - at Lamoureux71S - Selected branch vars

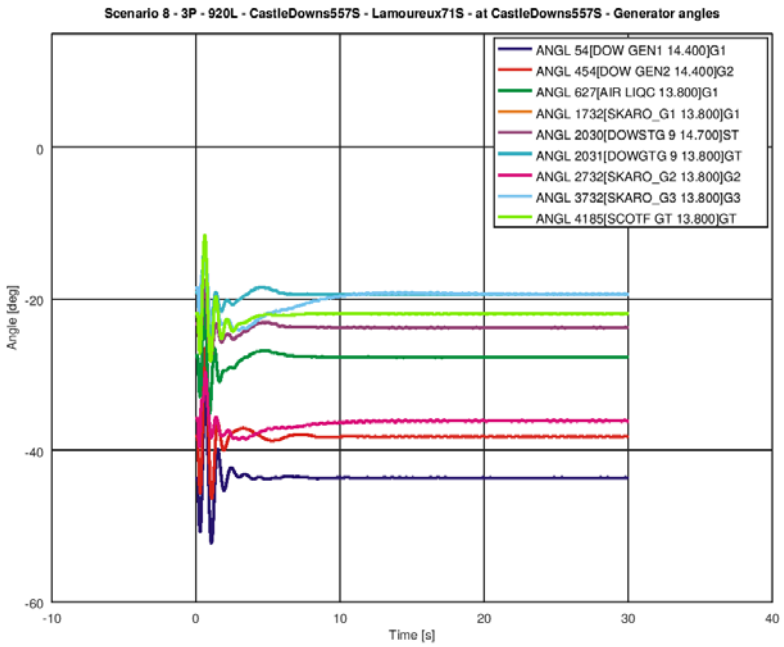


Figure A-1159 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

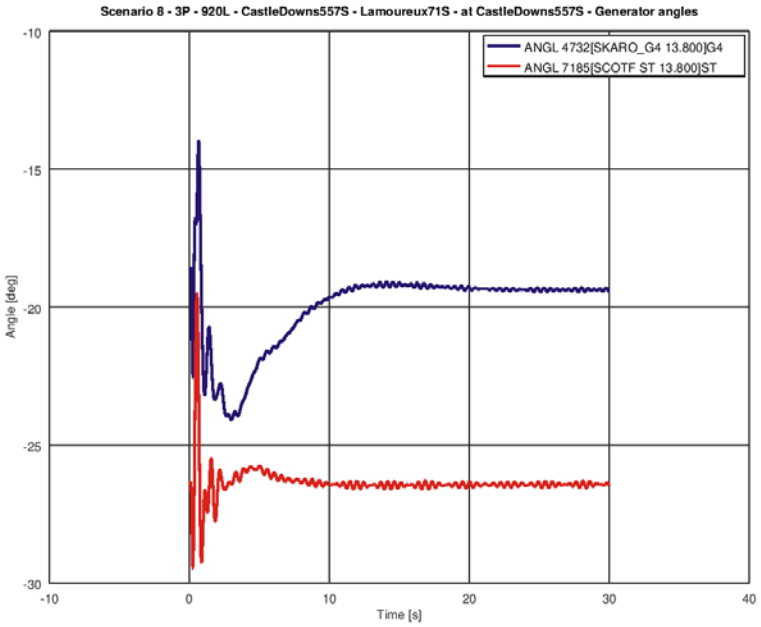


Figure A-1160 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

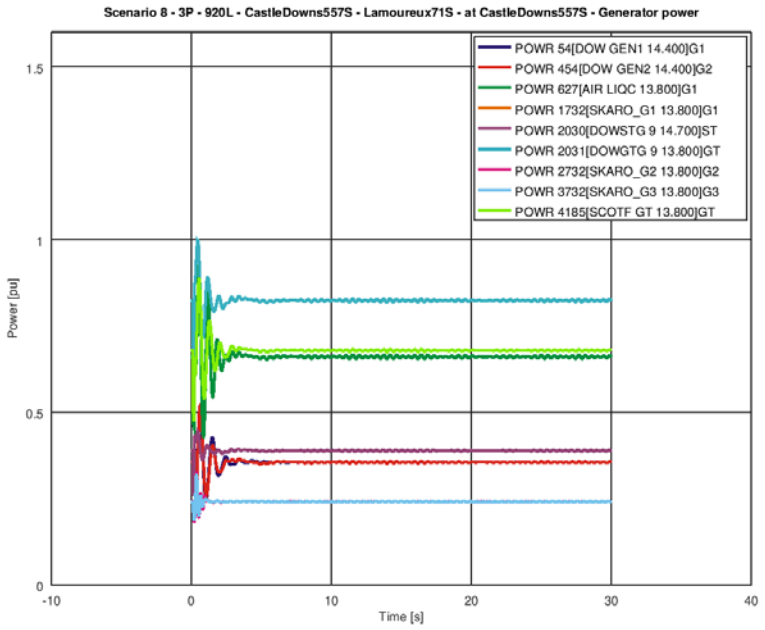


Figure A-1161 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

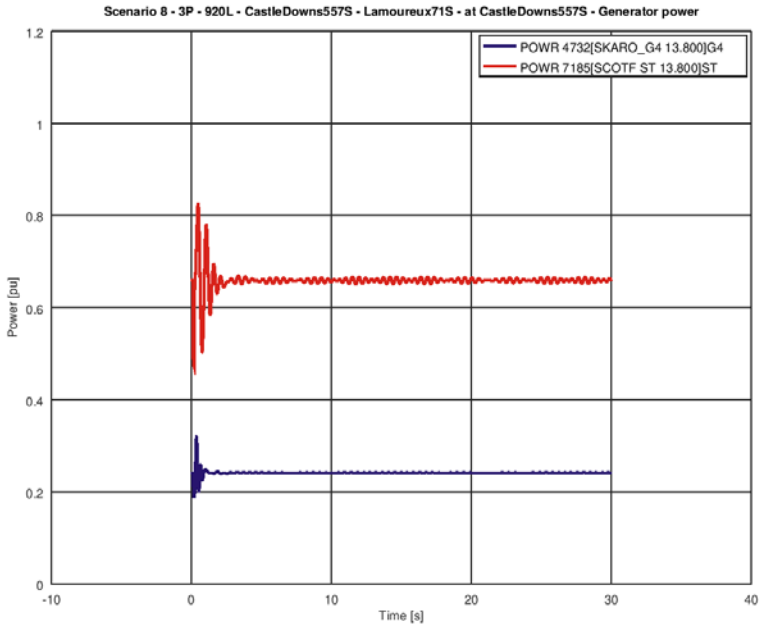


Figure A-1162 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

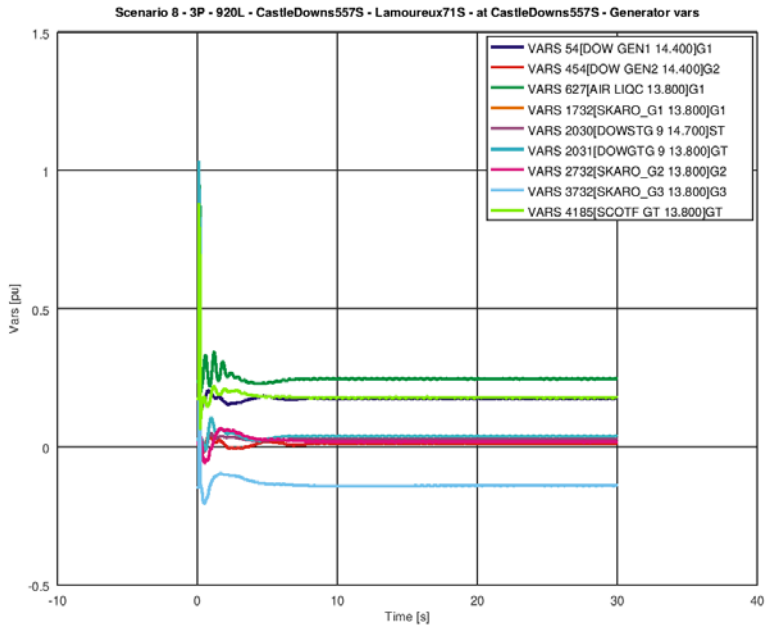


Figure A-1163 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

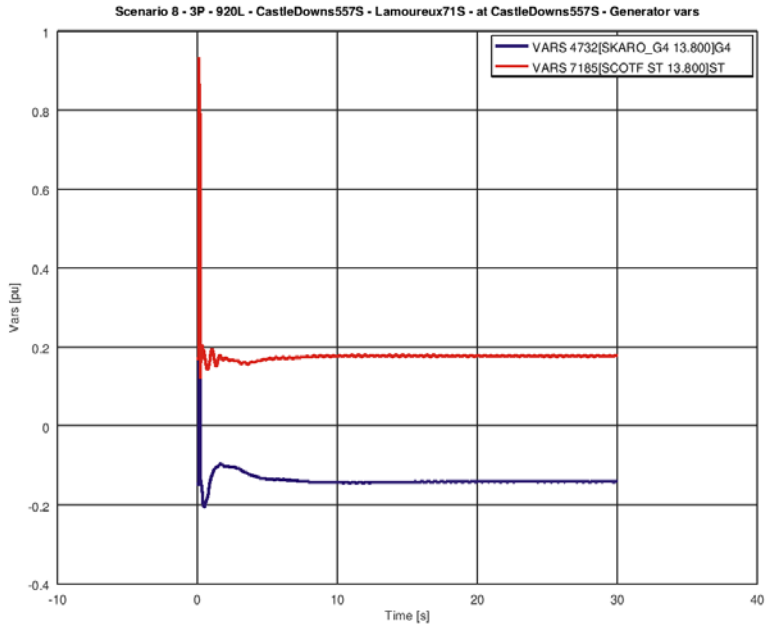


Figure A-1164 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

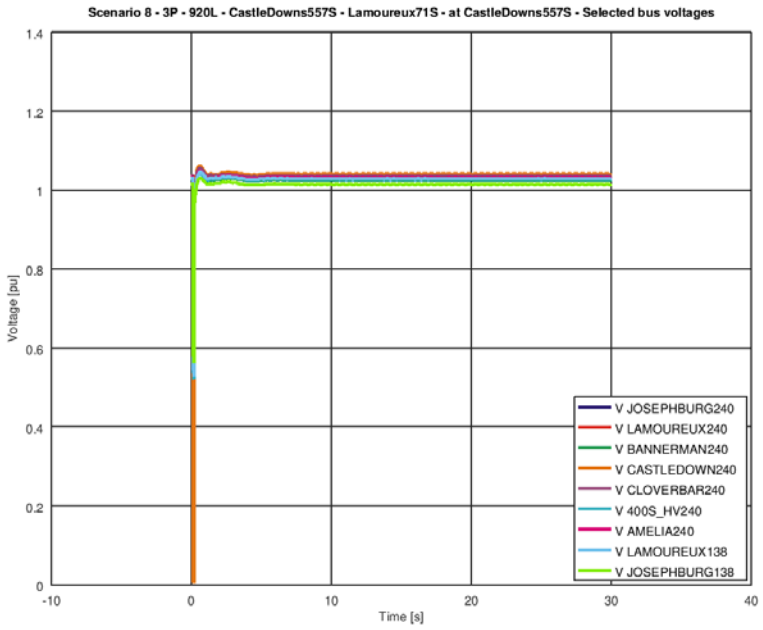


Figure A-1165 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

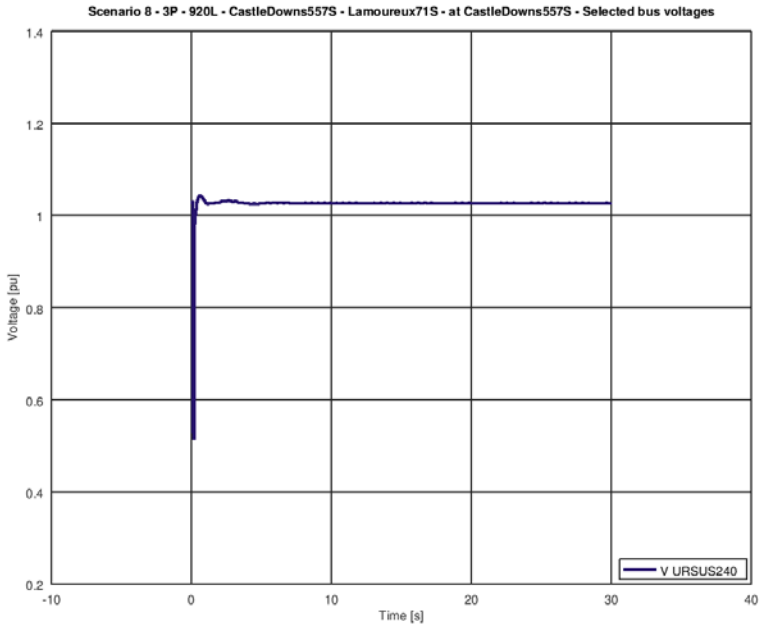


Figure A-1166 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

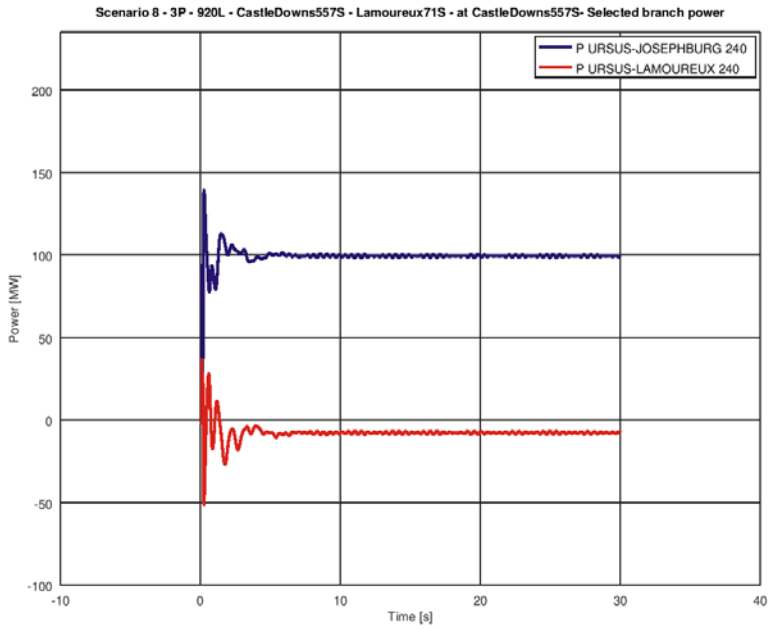


Figure A-1167 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

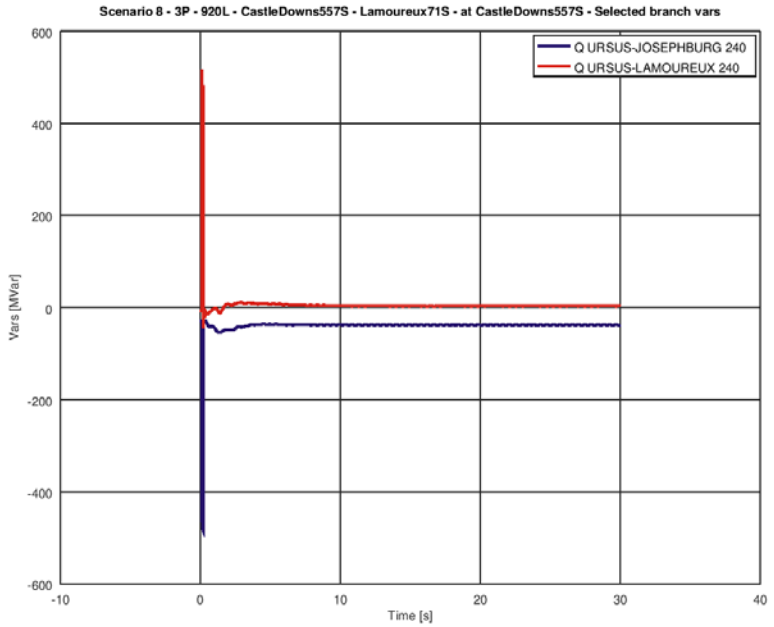


Figure A-1168 Scenario 8 - 3P - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

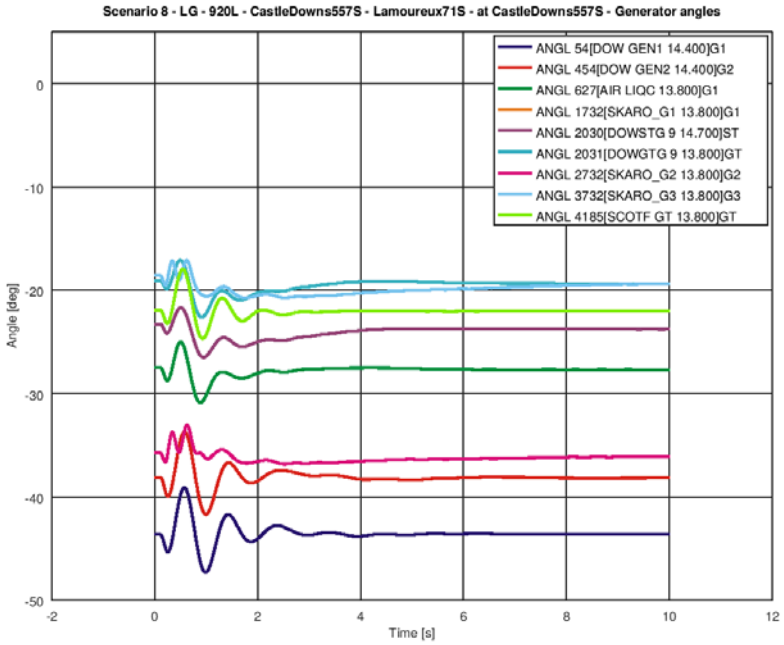


Figure A-1169 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

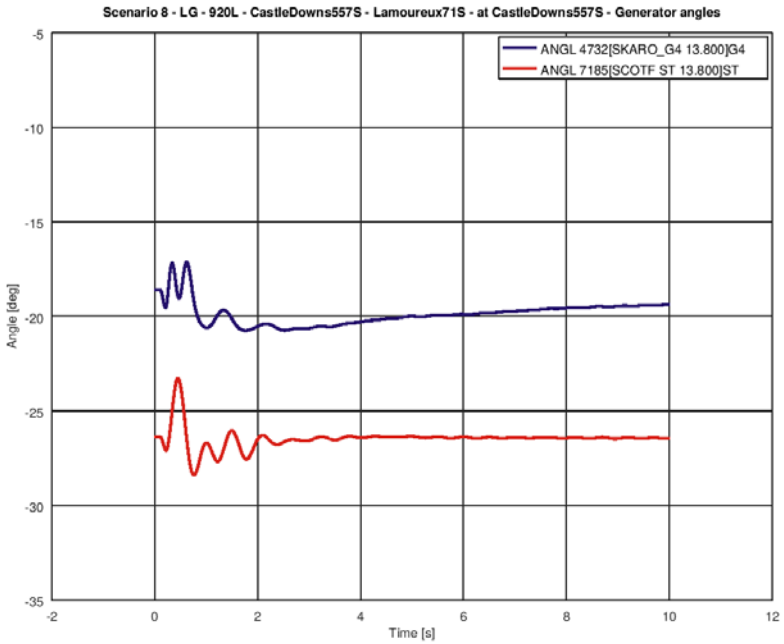


Figure A-1170 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator angles

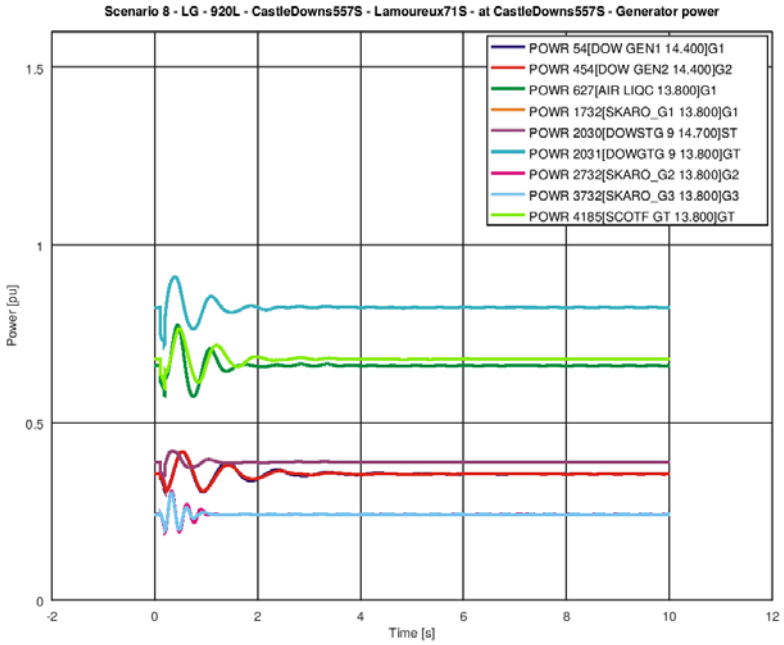


Figure A-1171 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

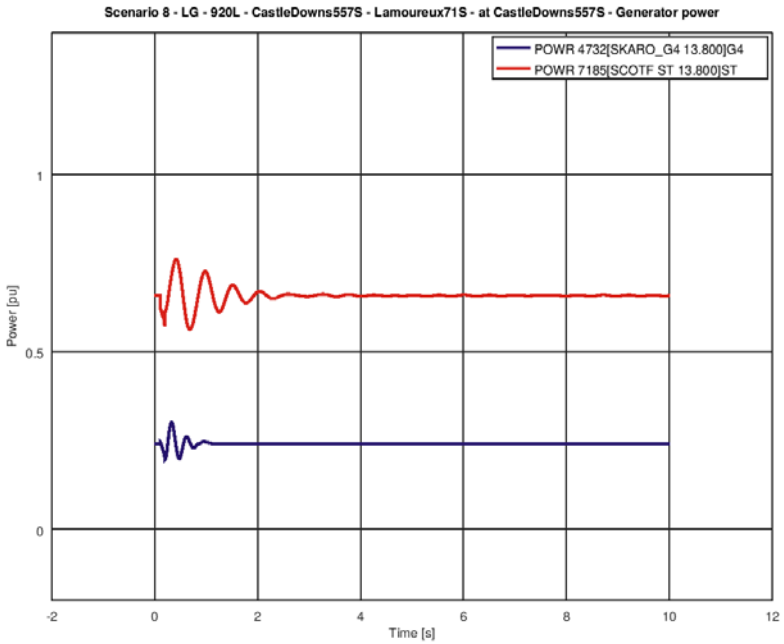


Figure A-1172 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator power

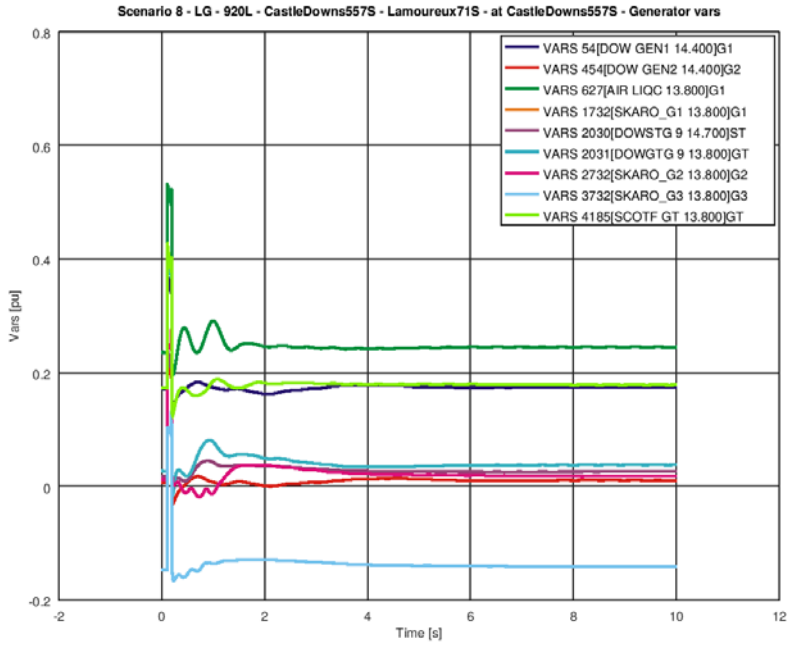


Figure A-1173 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

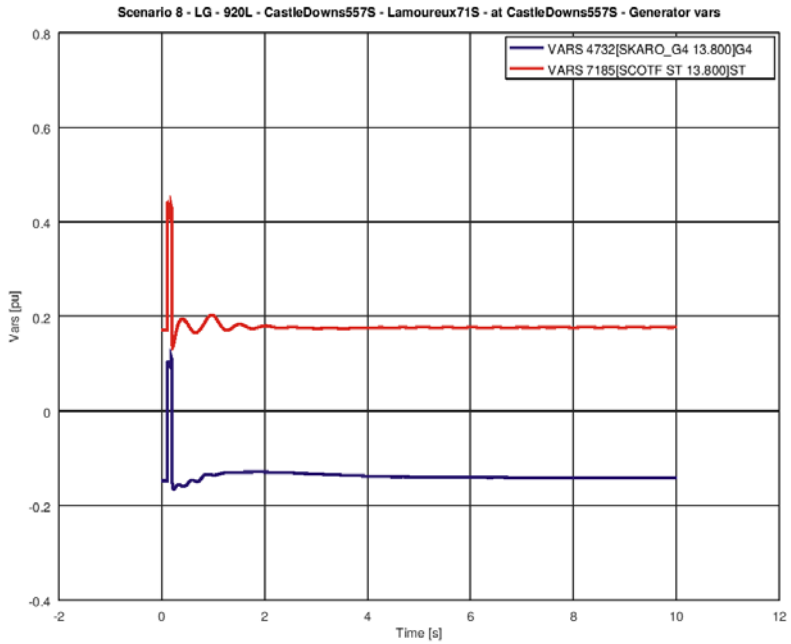


Figure A-1174 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Generator vars

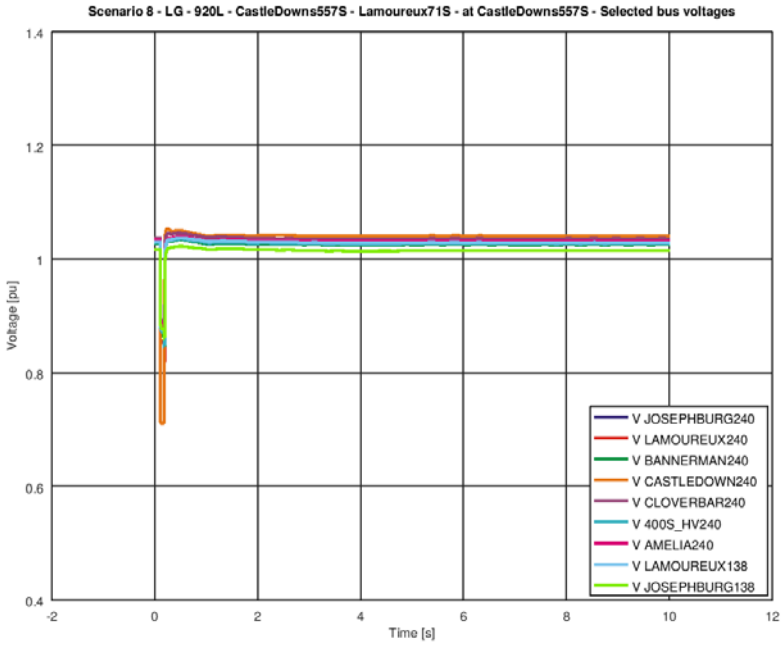


Figure A-1175 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

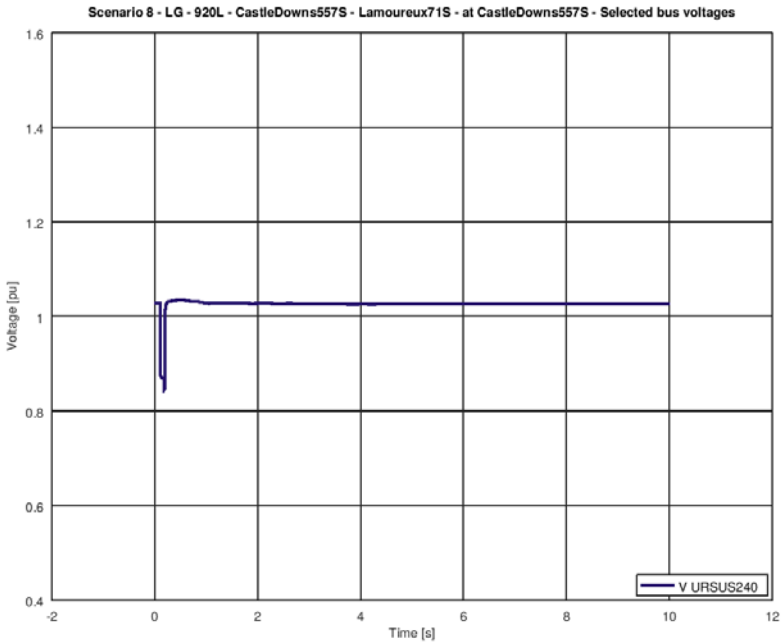


Figure A-1176 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected bus voltages

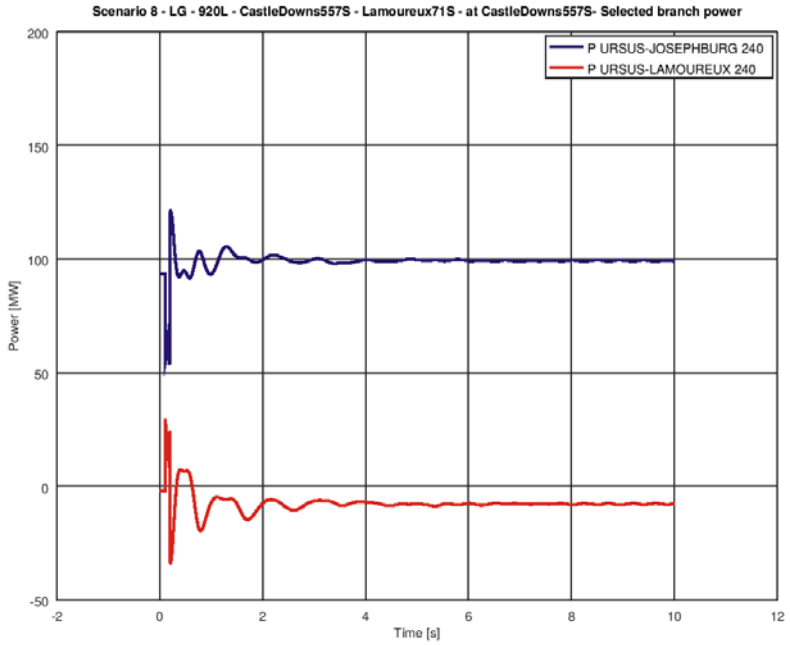


Figure A-1177 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch power

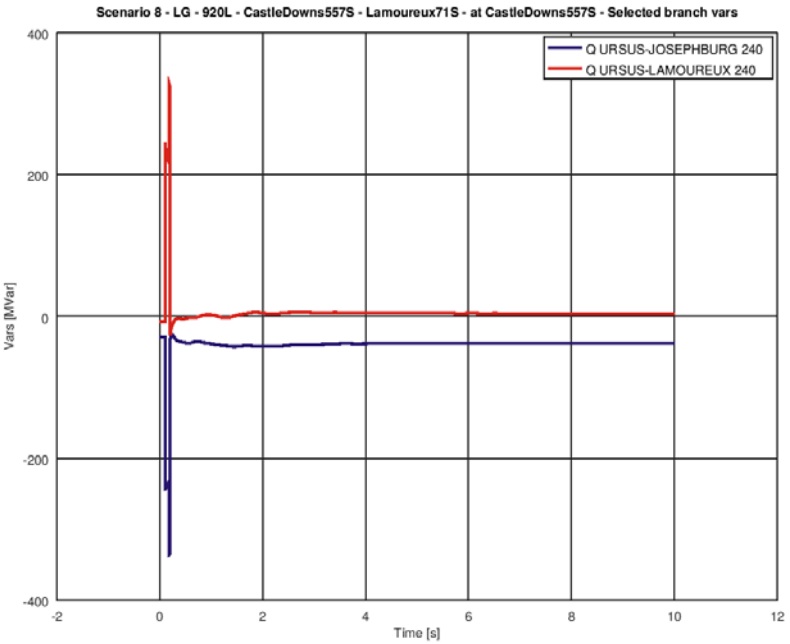


Figure A-1178 Scenario 8 - LG - 920L - CastleDowns557S - Lamoureux71S - at CastleDowns557S - Selected branch vars

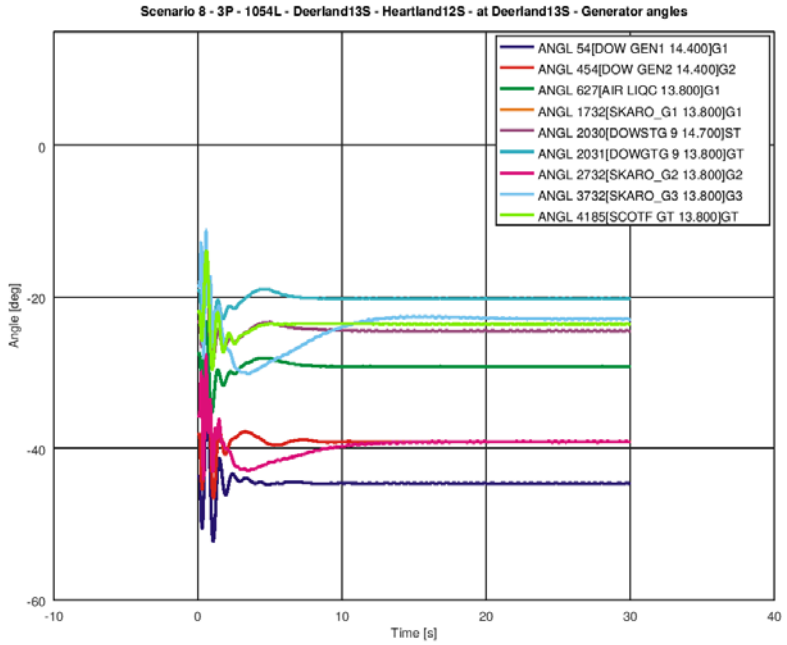


Figure A-1179 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

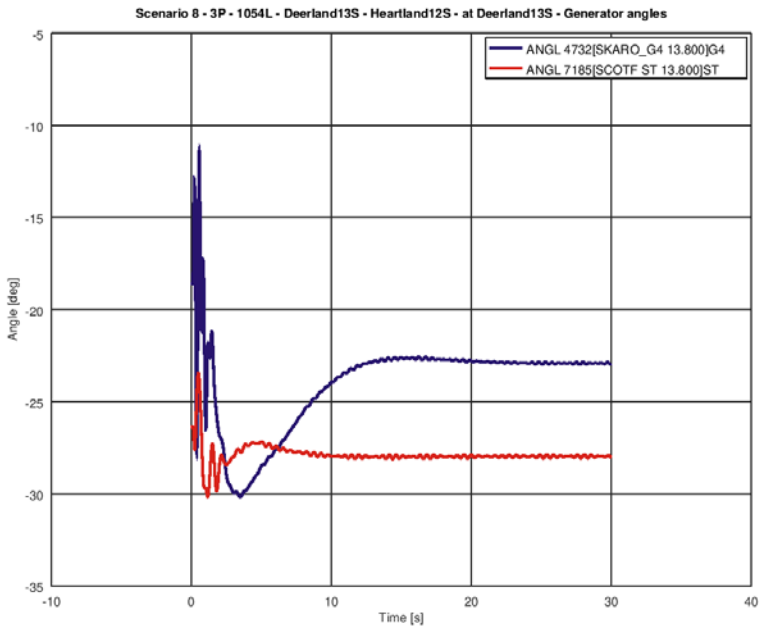


Figure A-1180 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

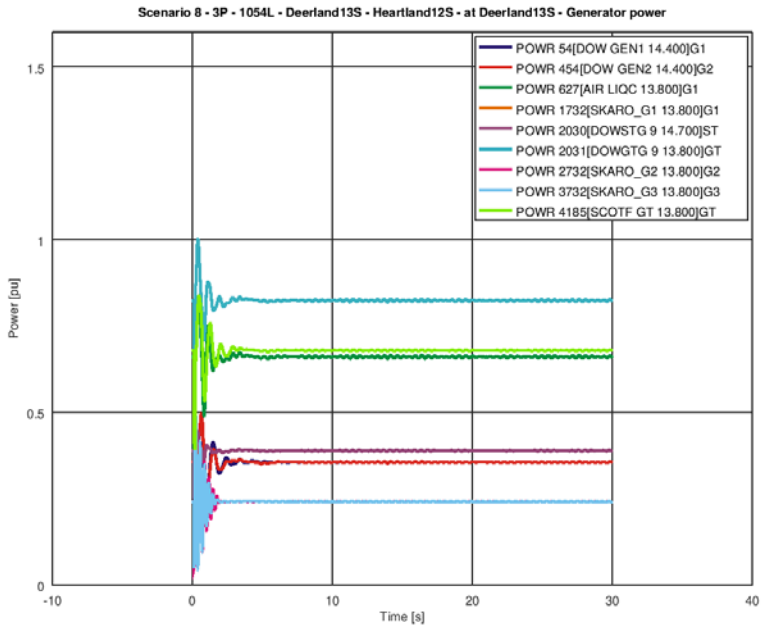


Figure A-1181 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

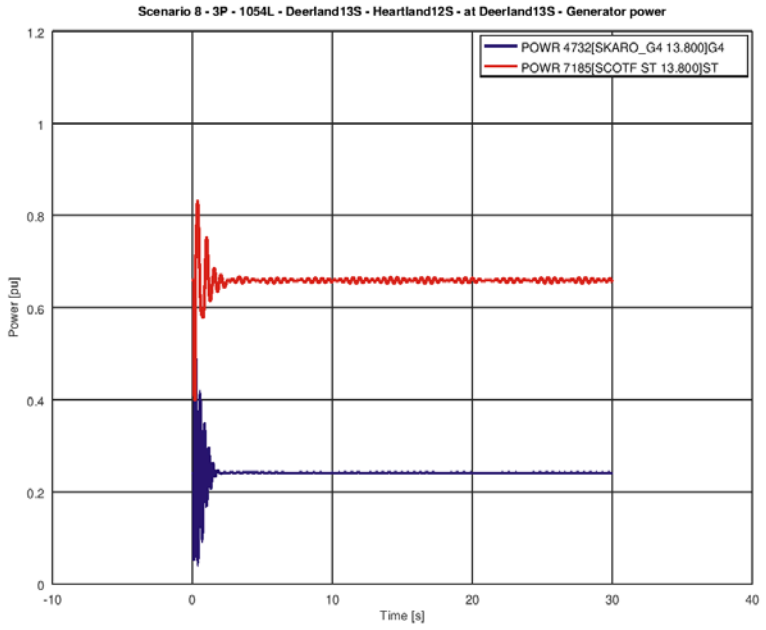


Figure A-1182 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

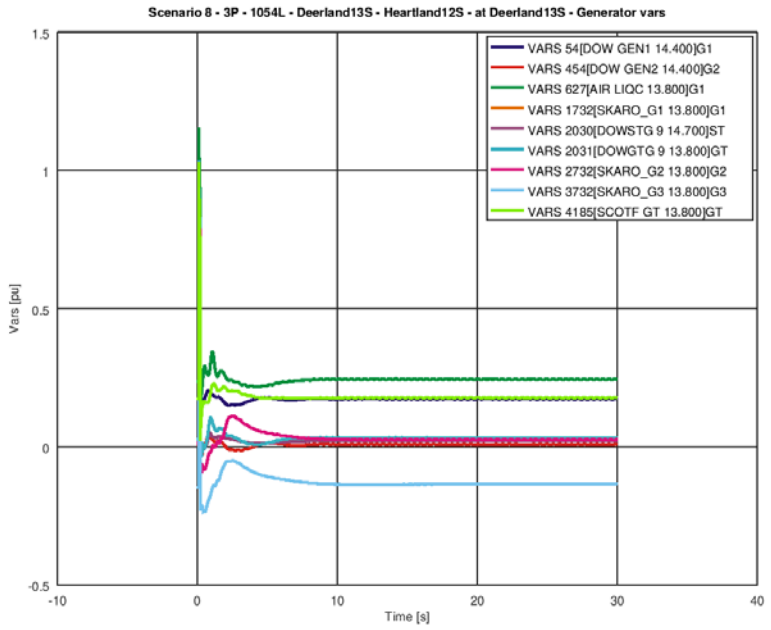


Figure A-1183 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

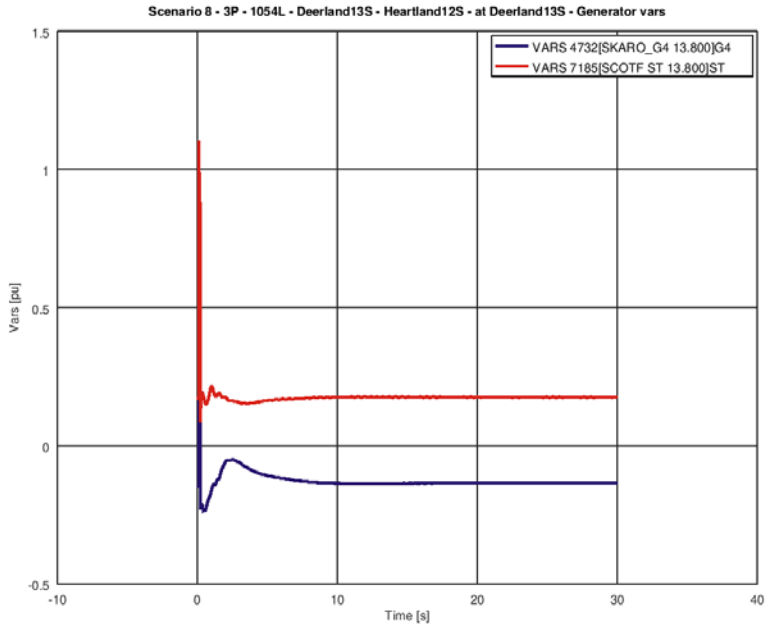


Figure A-1184 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

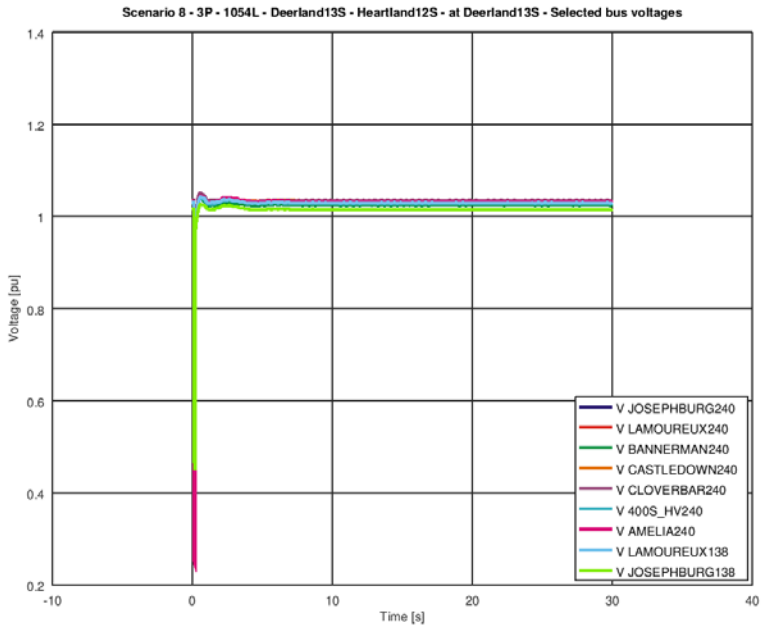


Figure A-1185 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

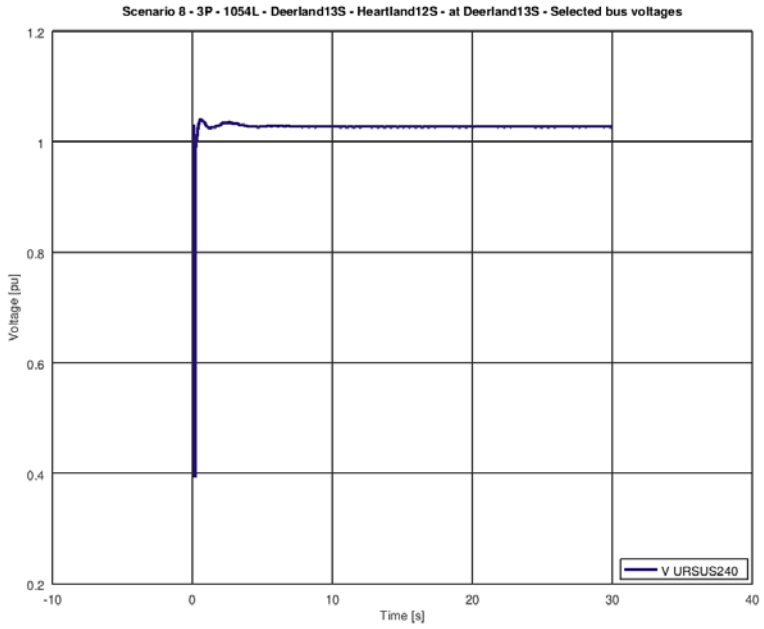


Figure A-1186 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

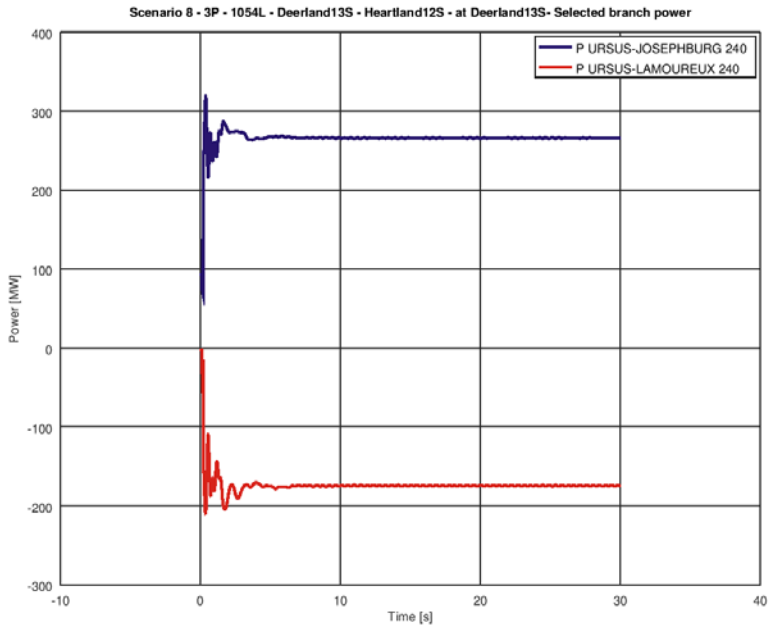


Figure A-1187 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

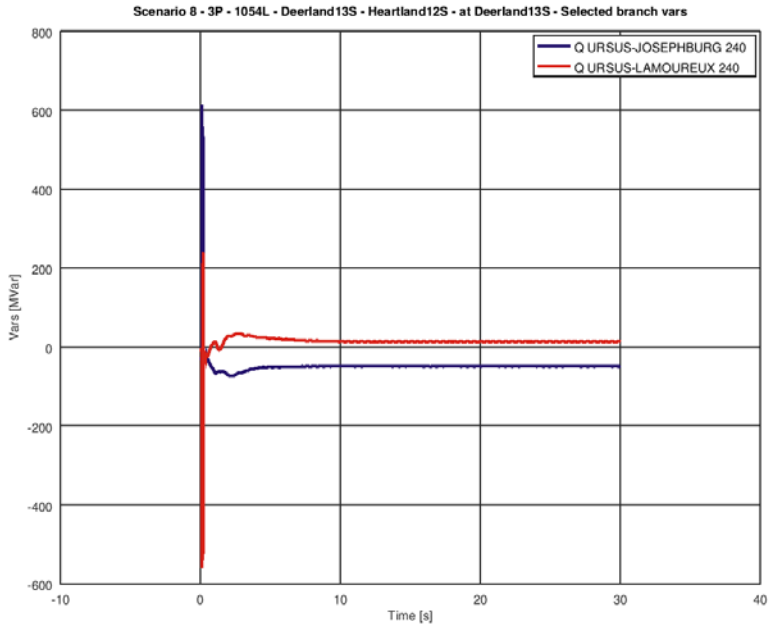


Figure A-1188 Scenario 8 - 3P - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

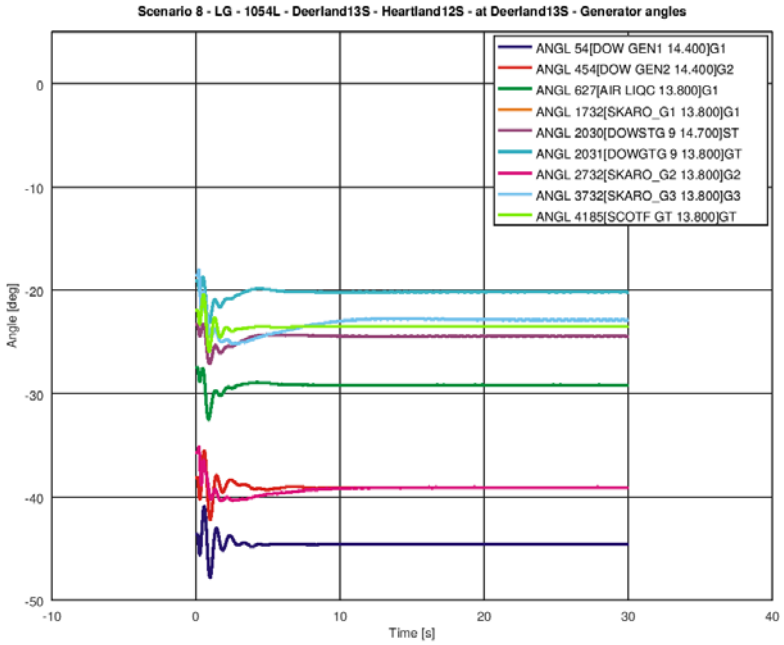


Figure A-1189 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

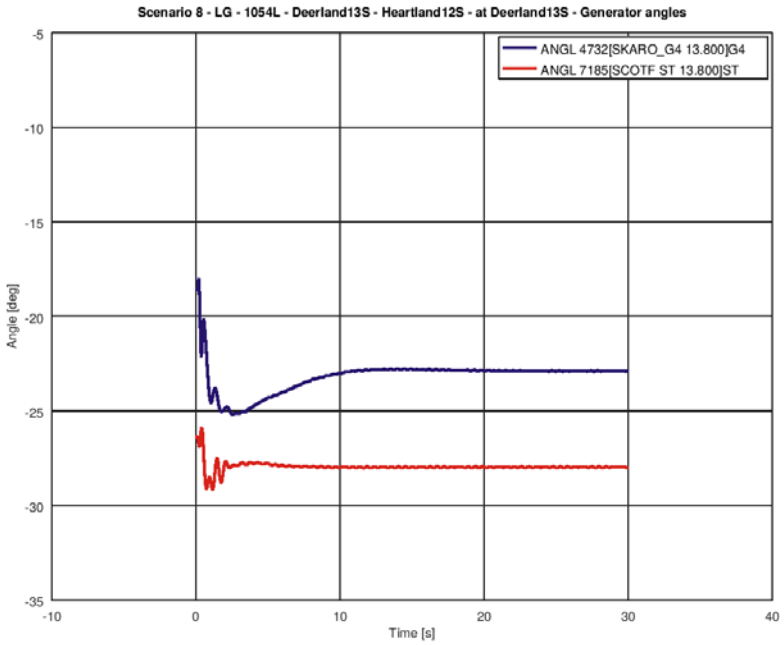


Figure A-1190 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator angles

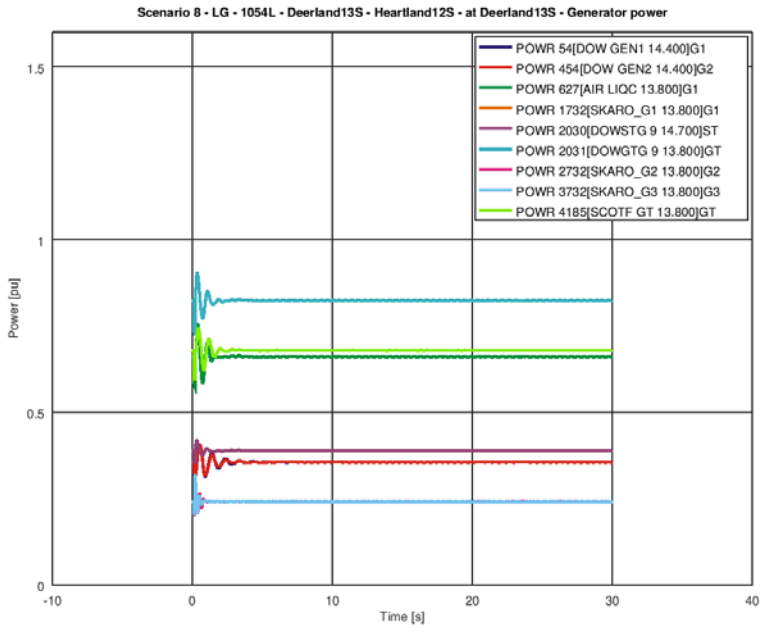


Figure A-1191 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

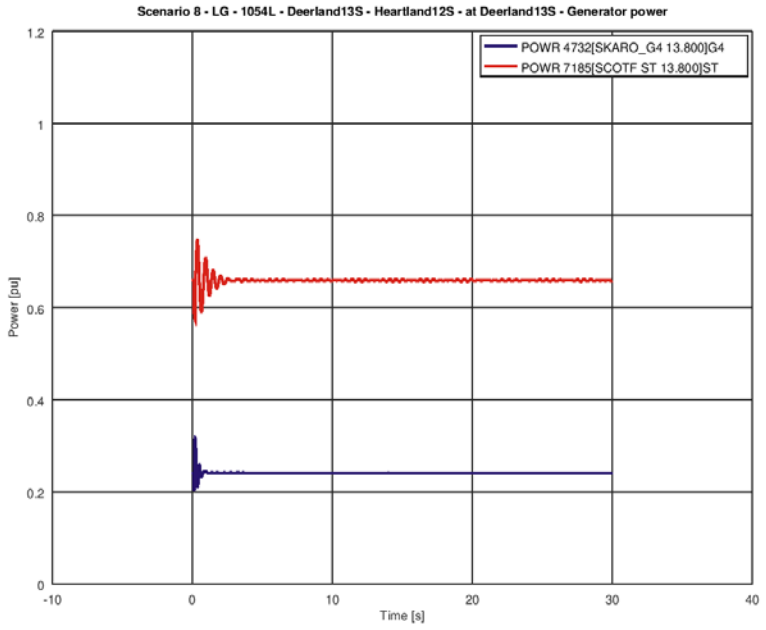


Figure A-1192 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator power

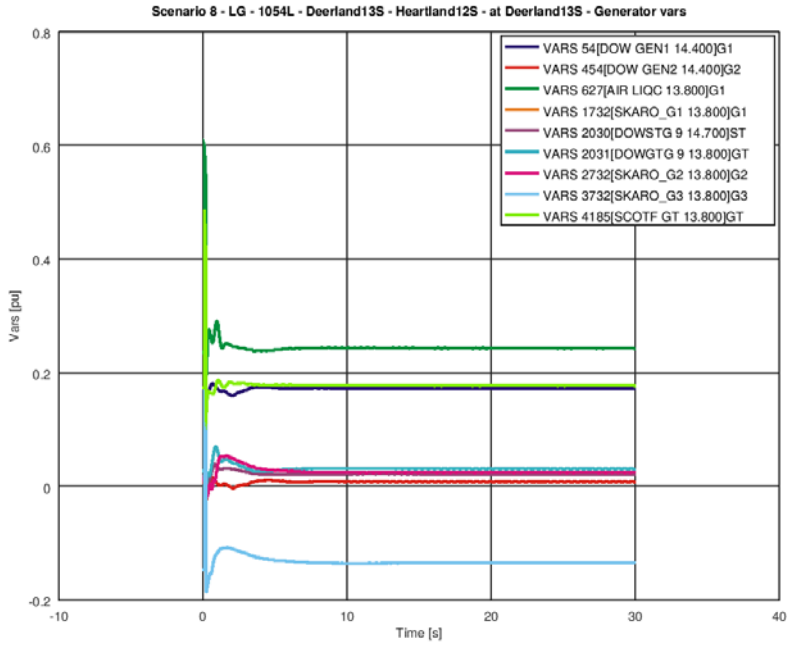


Figure A-1193 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

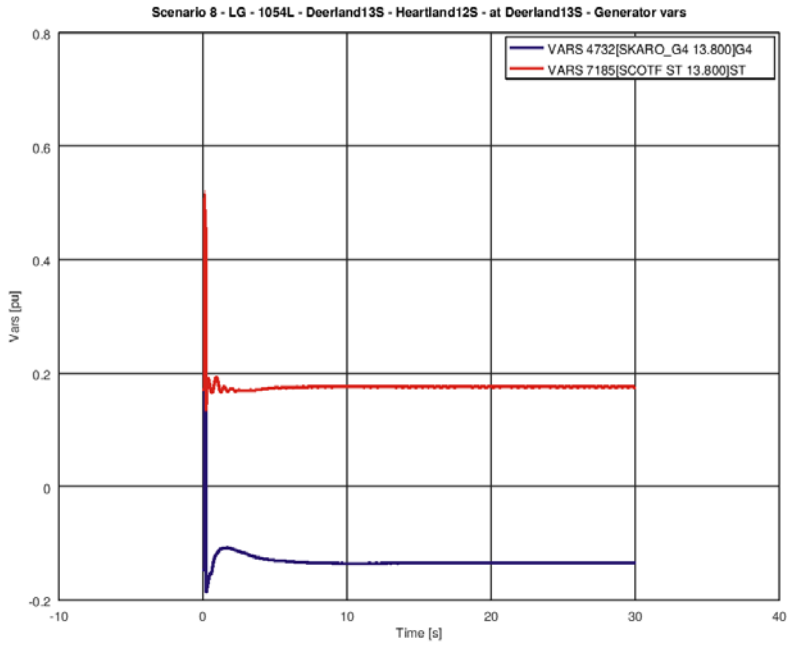


Figure A-1194 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Generator vars

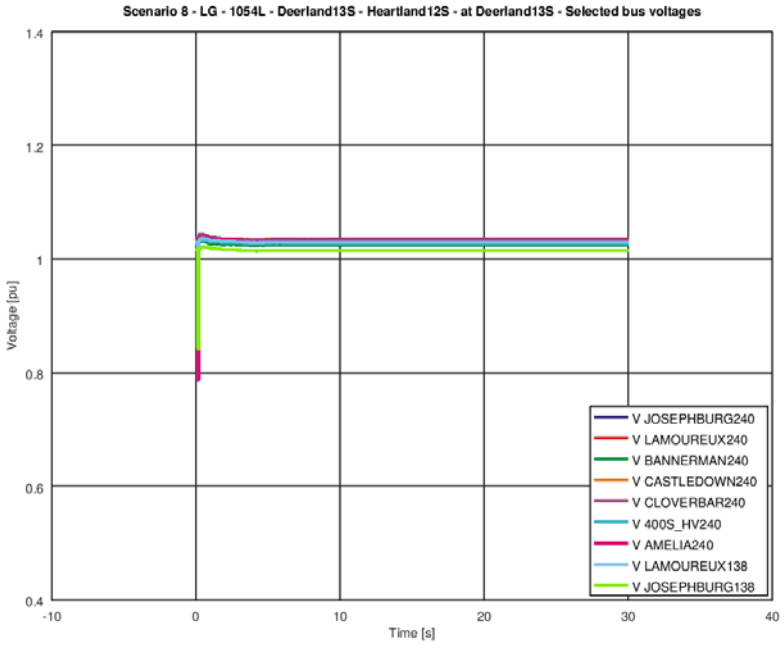


Figure A-1195 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

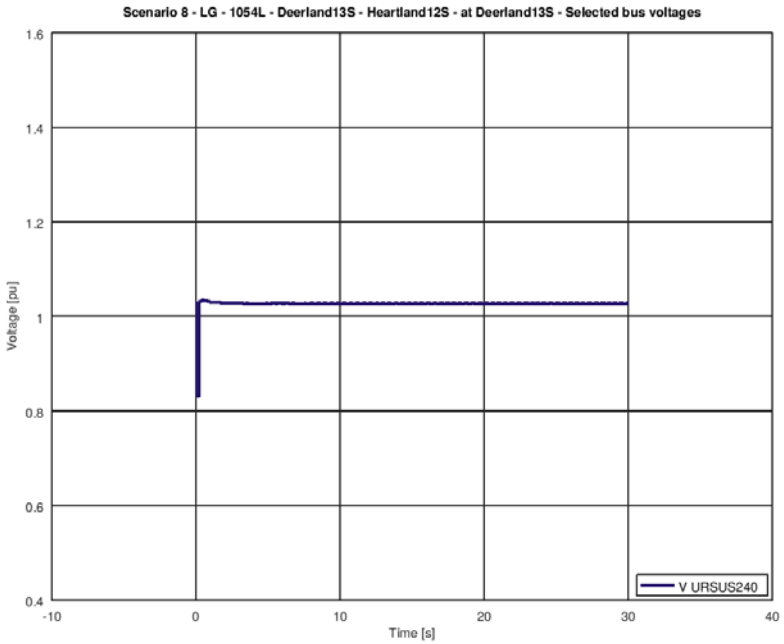


Figure A-1196 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected bus voltages

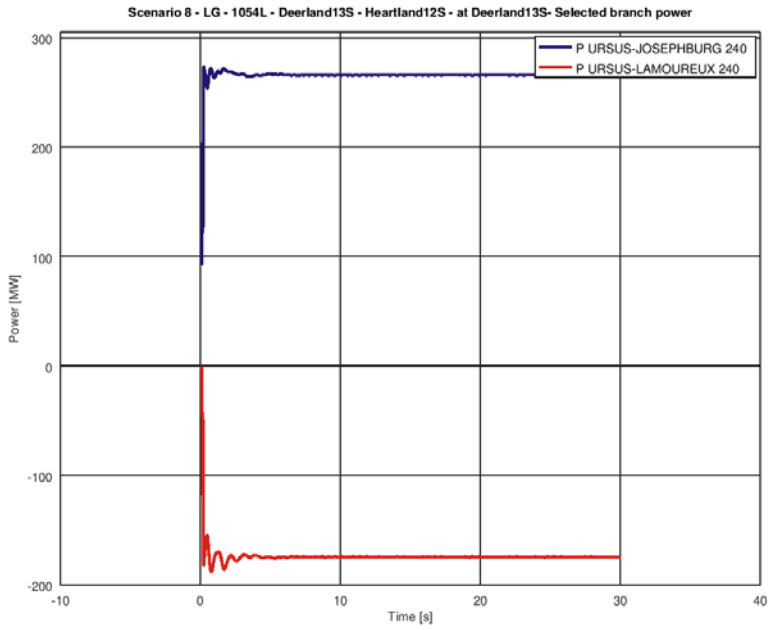


Figure A-1197 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch power

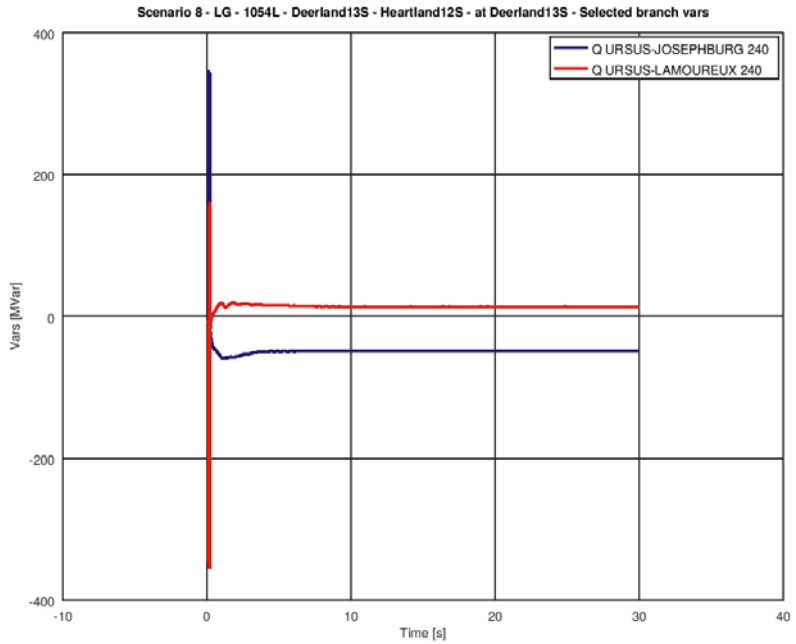


Figure A-1198 Scenario 8 - LG - 1054L - Deerland13S - Heartland12S - at Deerland13S - Selected branch vars

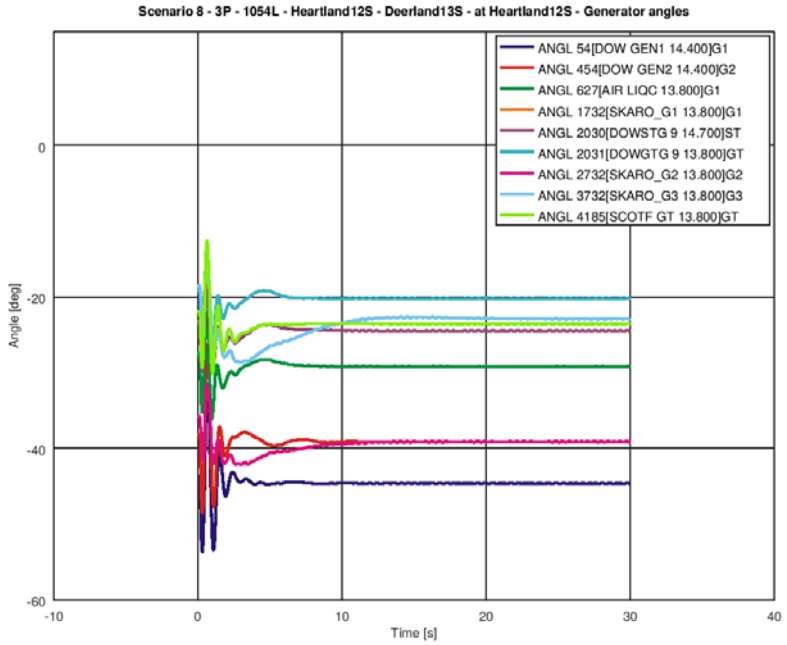


Figure A-1199 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

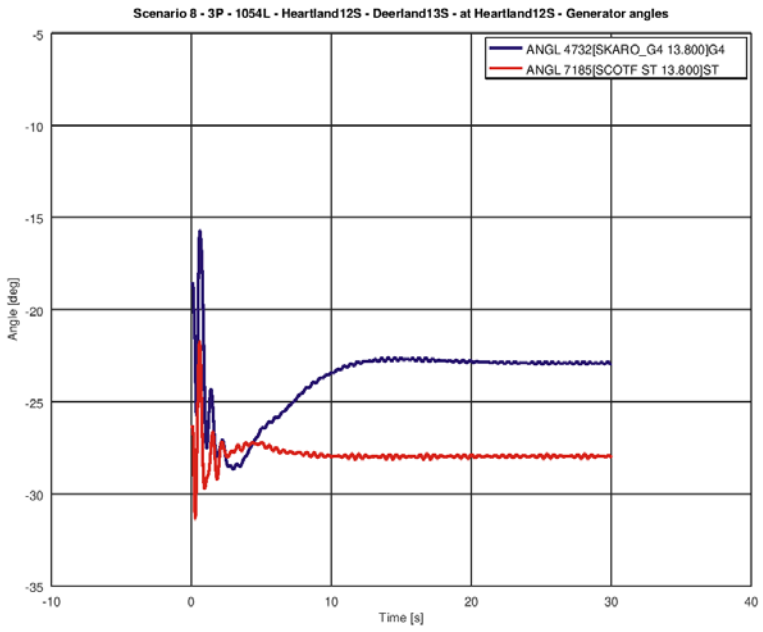


Figure A-1200 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

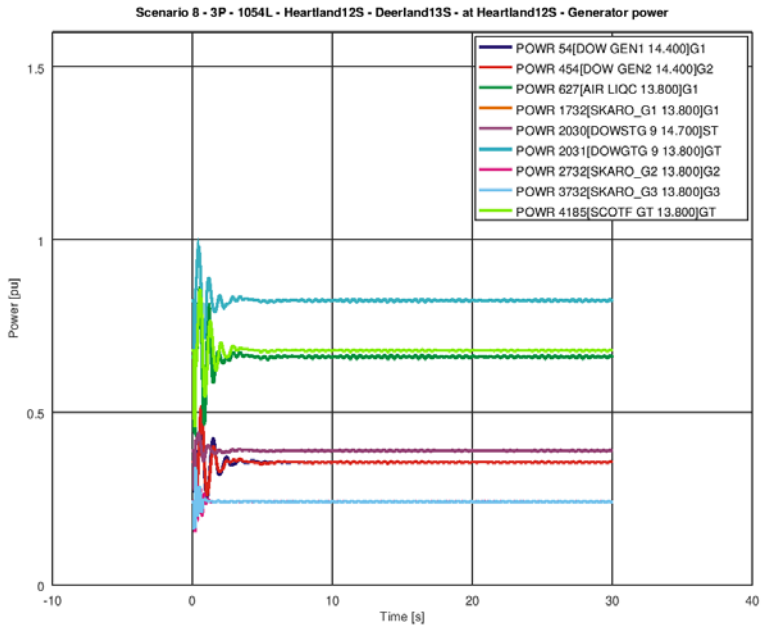


Figure A-1201 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

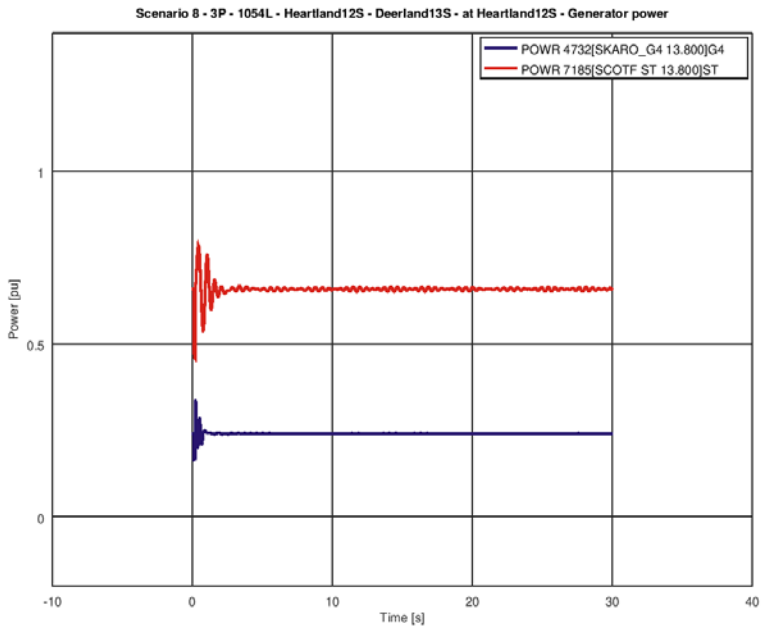


Figure A-1202 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

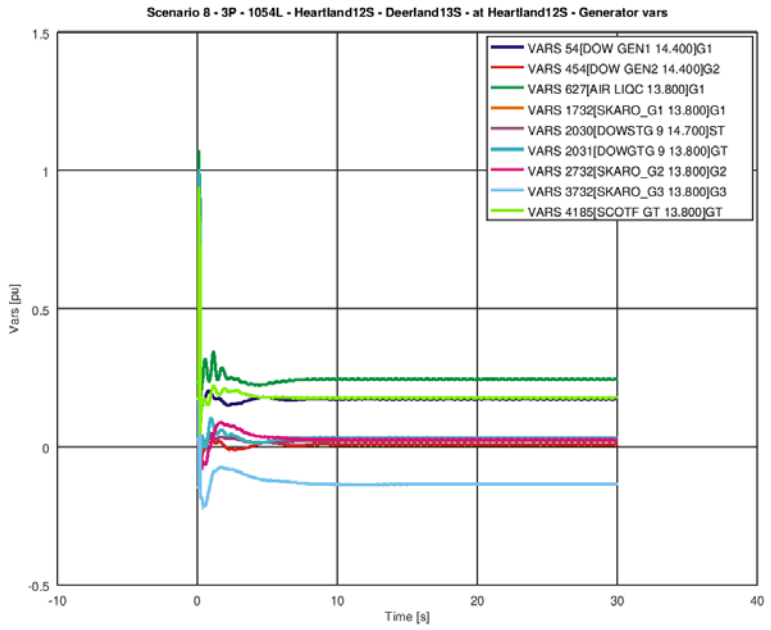


Figure A-1203 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

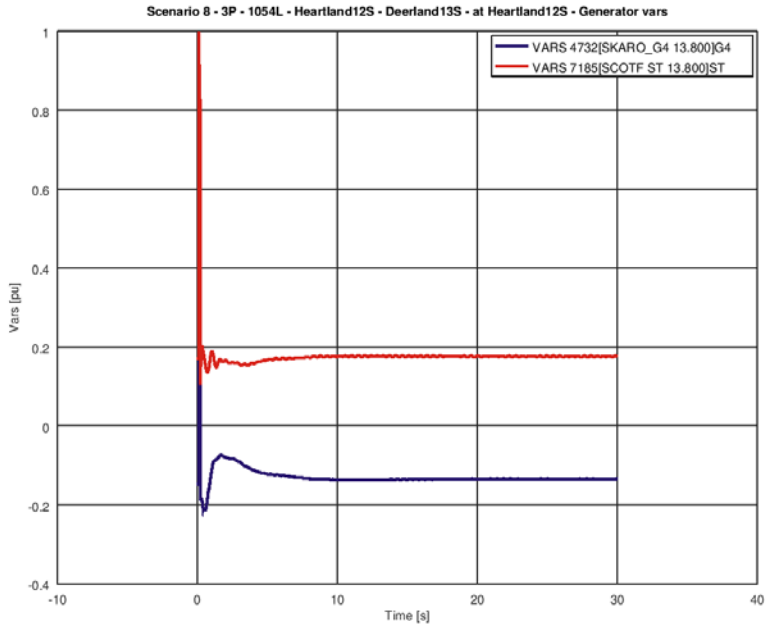


Figure A-1204 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

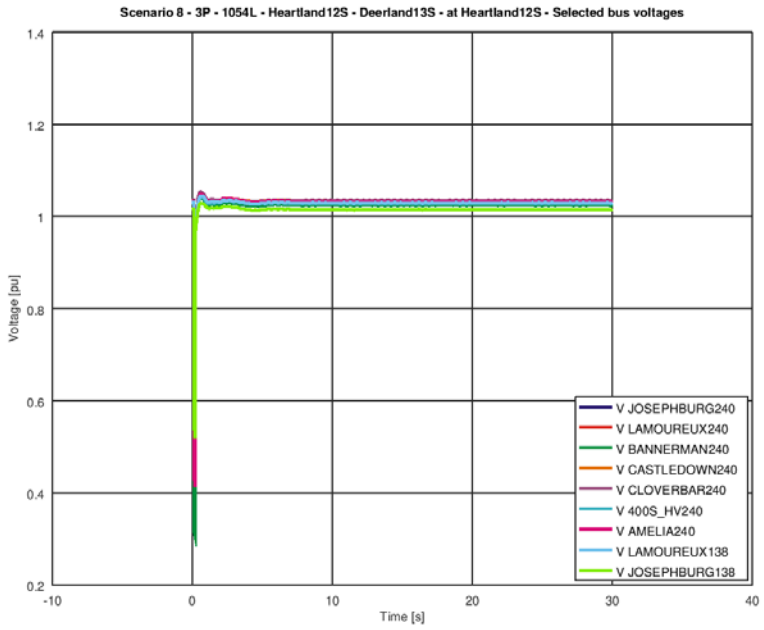


Figure A-1205 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

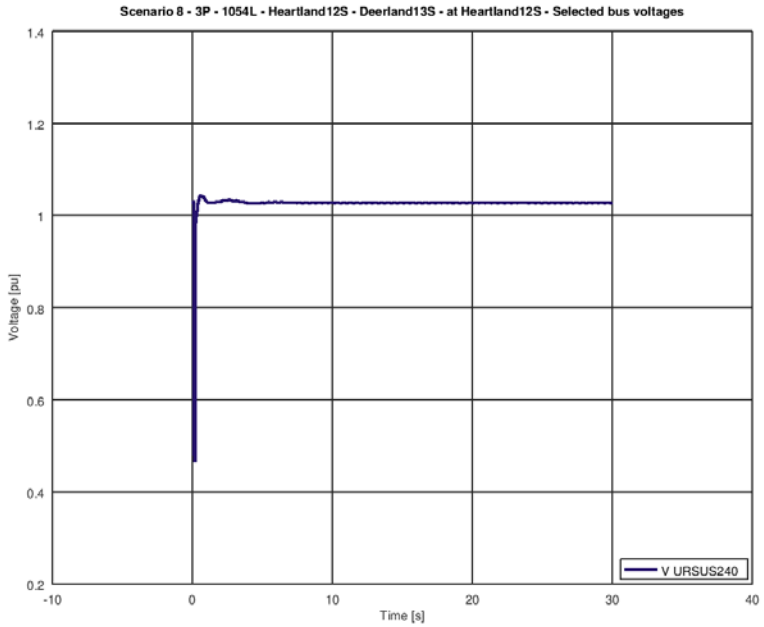


Figure A-1206 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

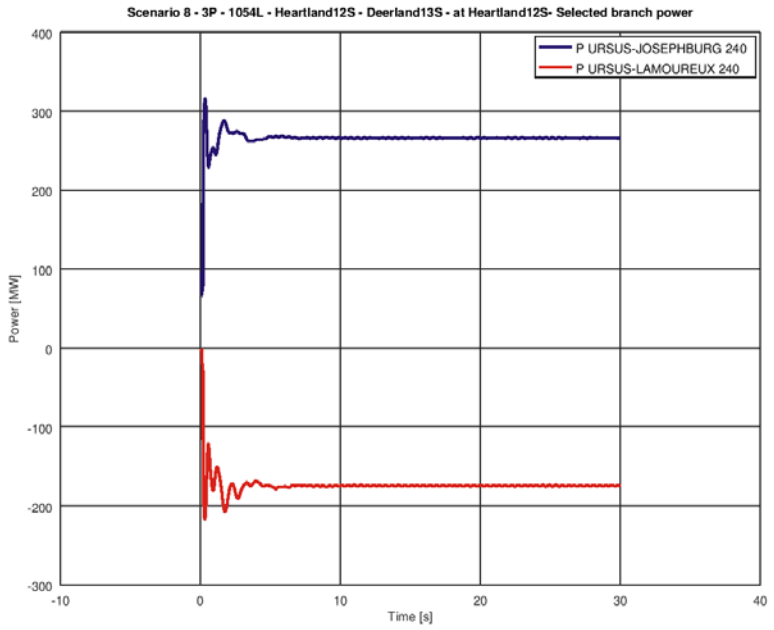


Figure A-1207 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

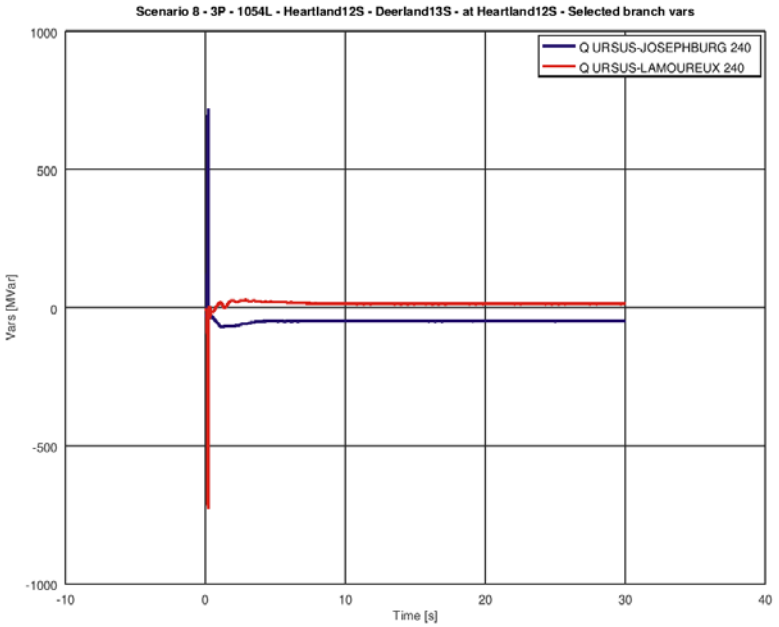


Figure A-1208 Scenario 8 - 3P - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

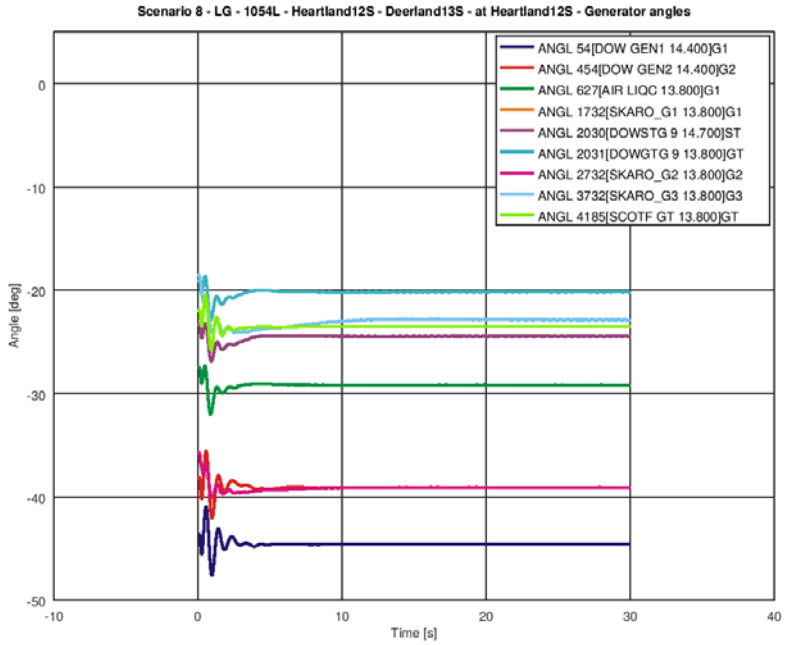


Figure A-1209 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

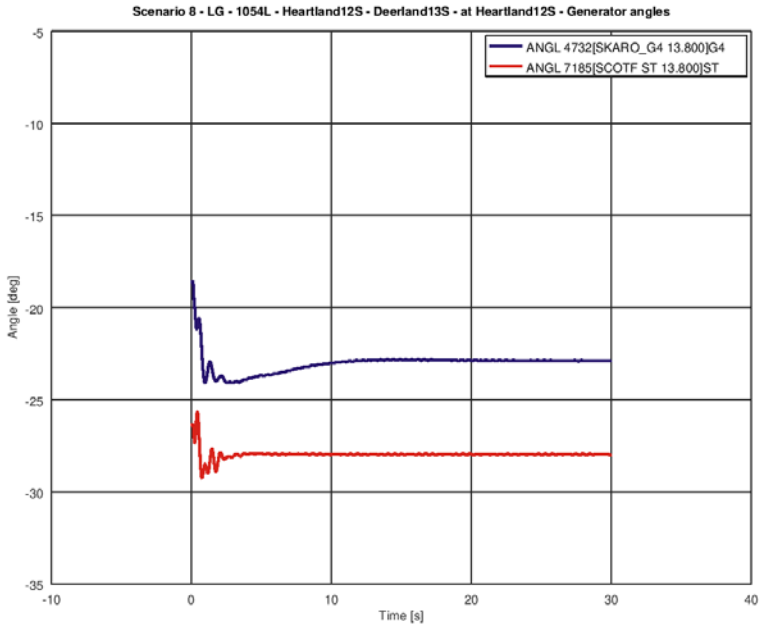


Figure A-1210 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator angles

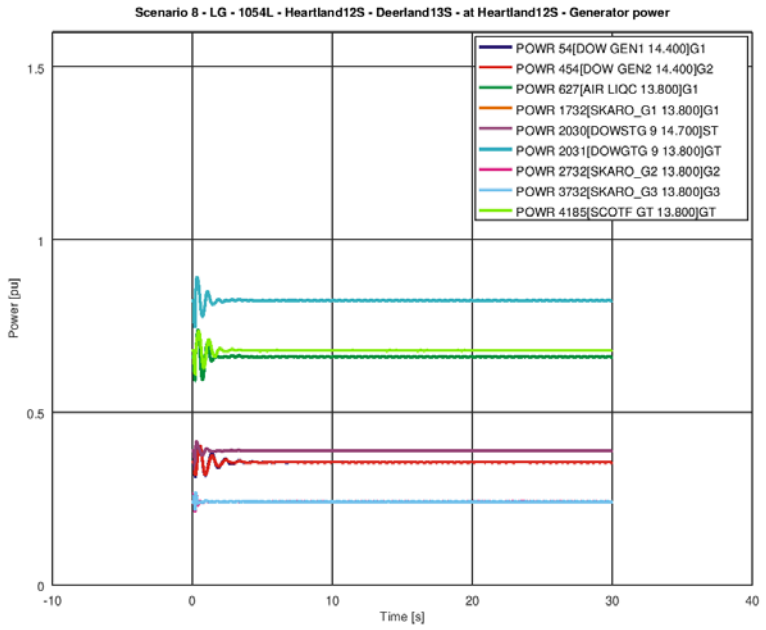


Figure A-1211 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

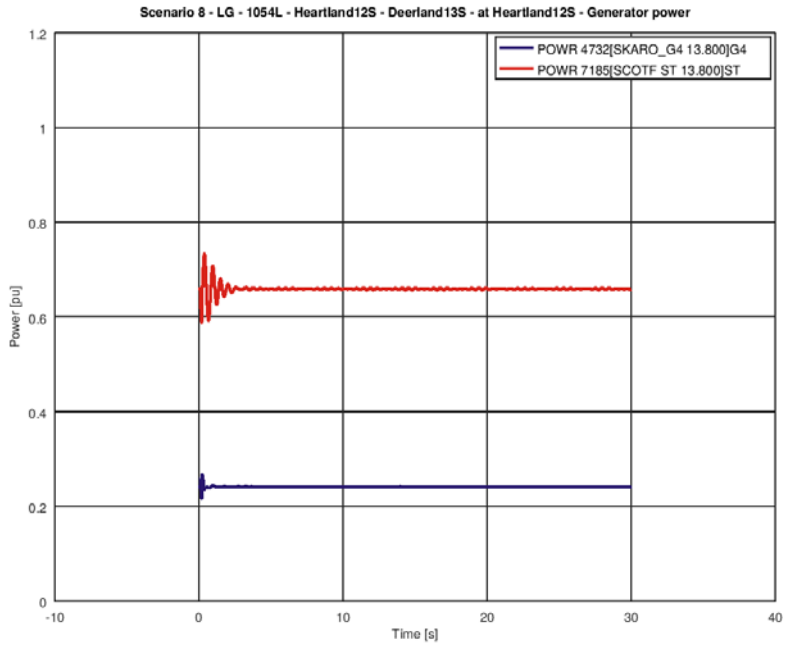


Figure A-1212 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator power

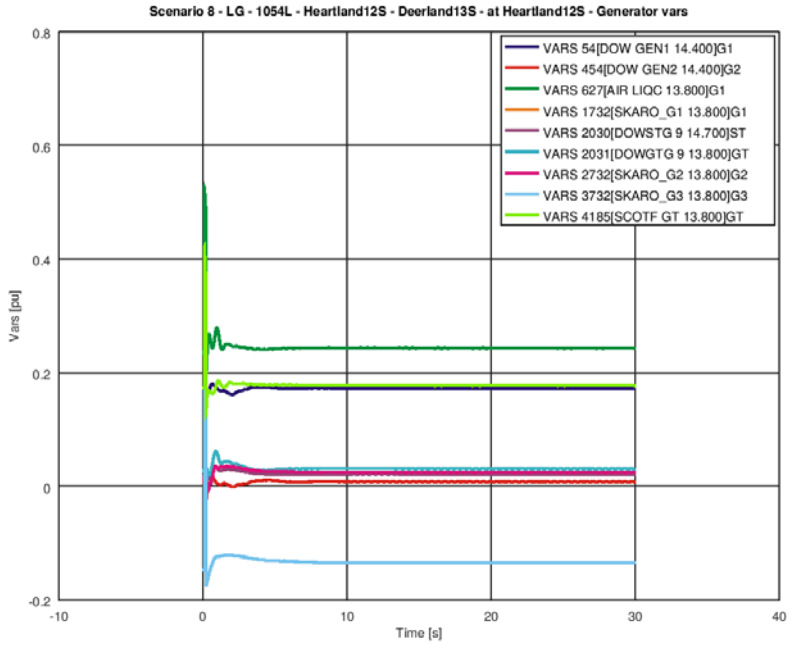


Figure A-1213 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

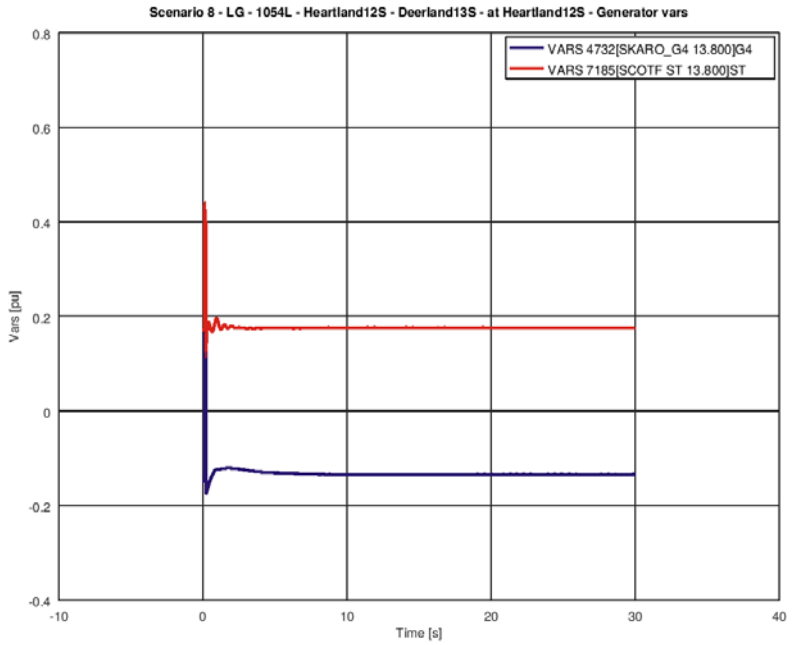


Figure A-1214 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Generator vars

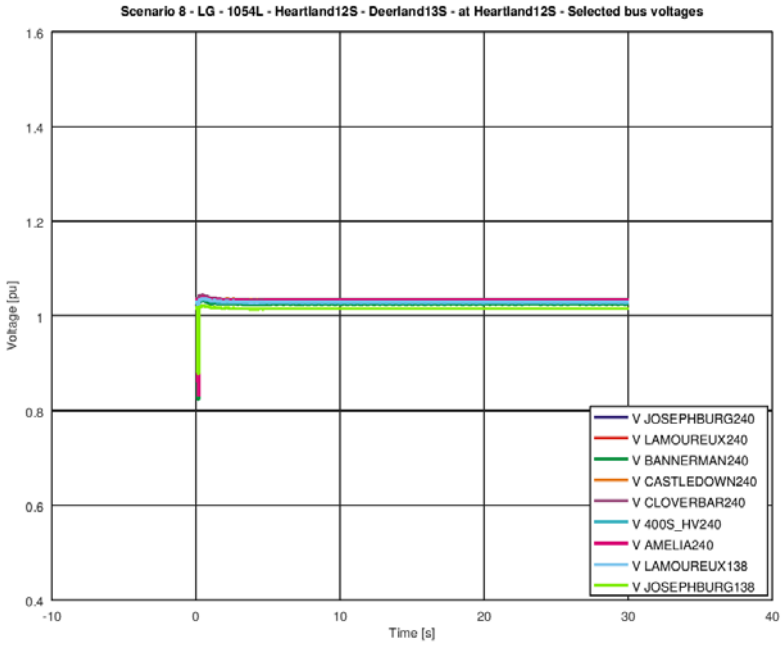


Figure A-1215 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

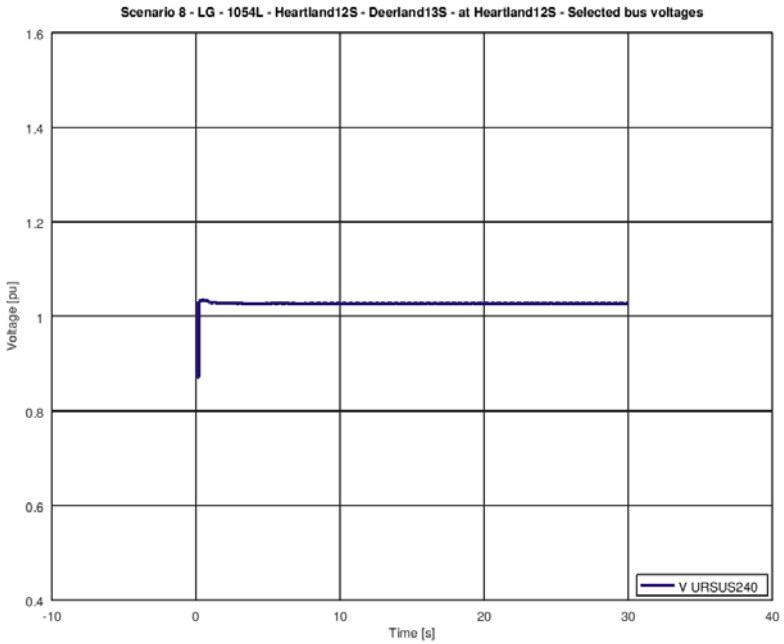


Figure A-1216 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected bus voltages

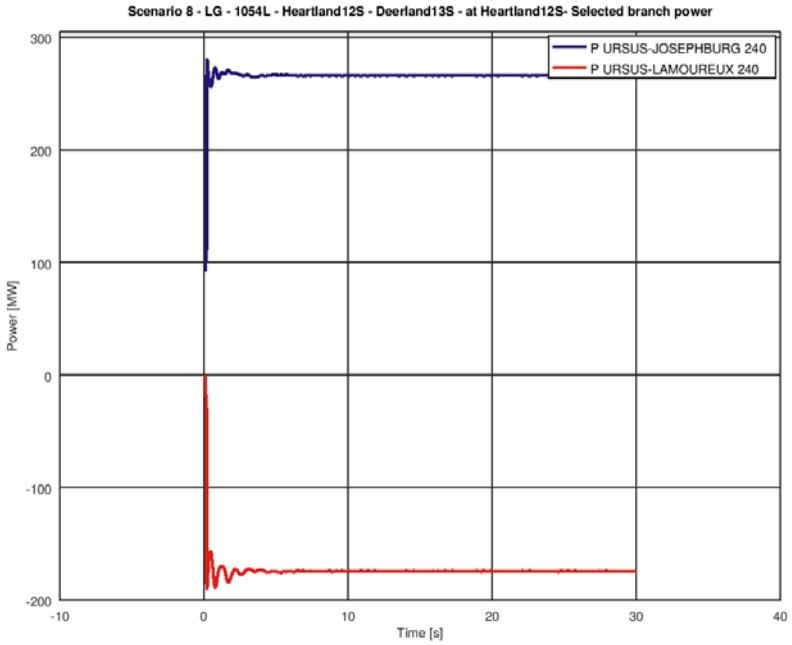


Figure A-1217 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch power

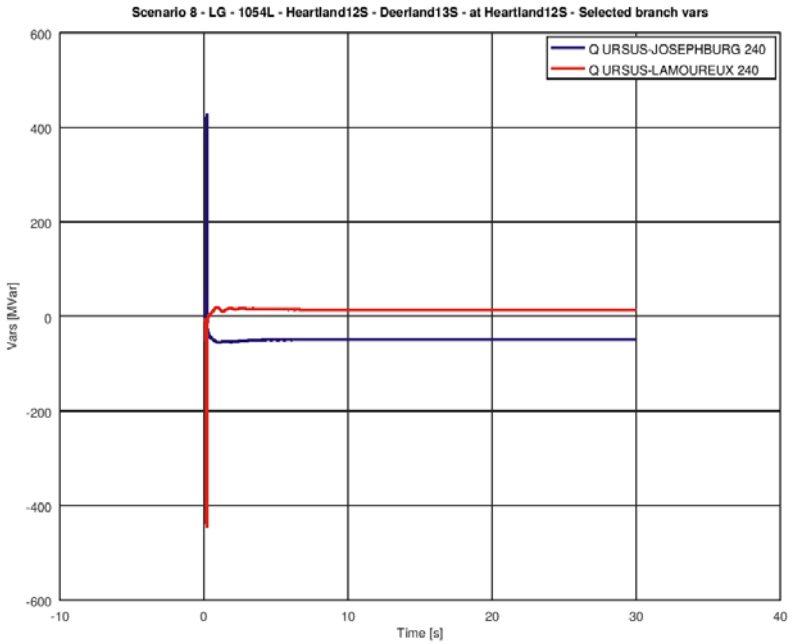


Figure A-1218 Scenario 8 - LG - 1054L - Heartland12S - Deerland13S - at Heartland12S - Selected branch vars

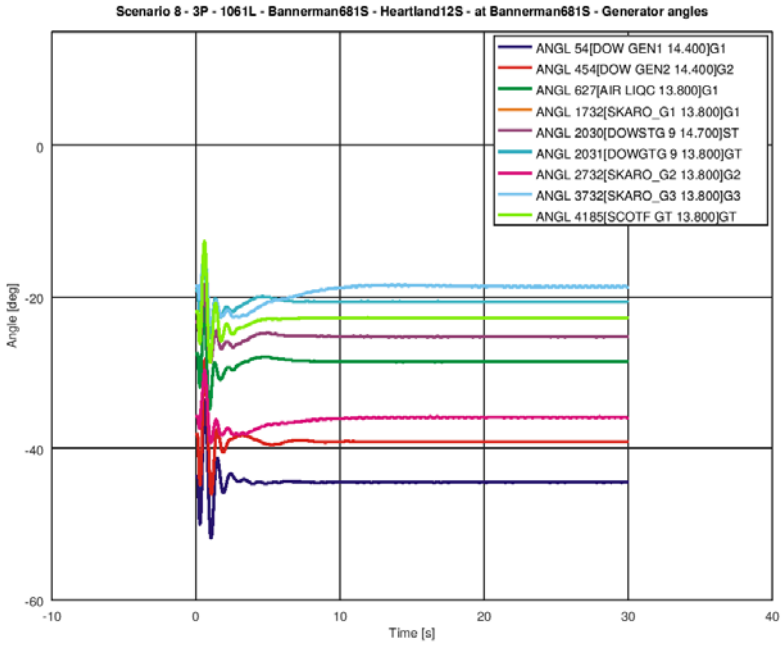


Figure A-1219 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

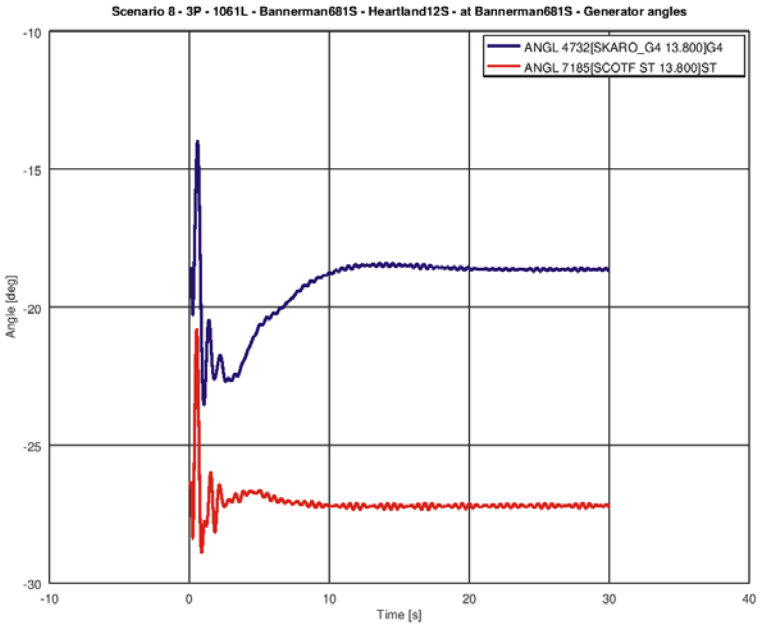


Figure A-1220 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

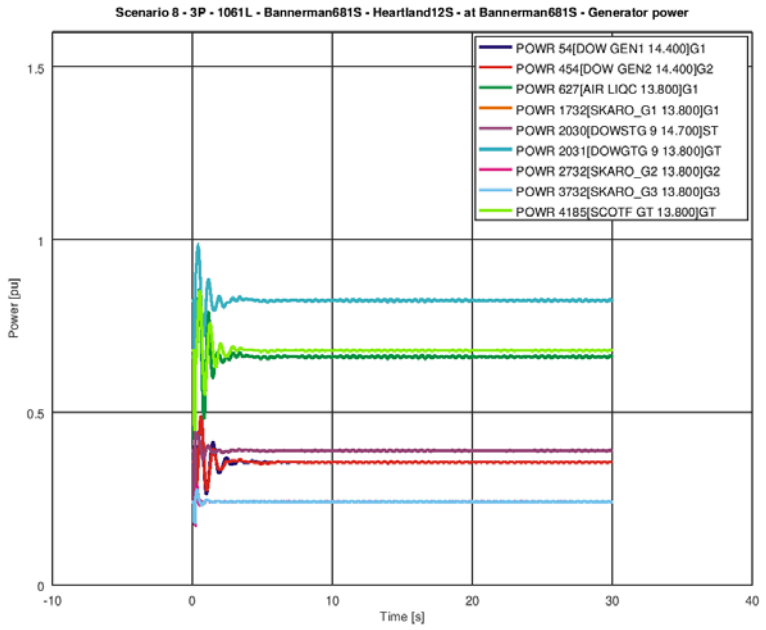


Figure A-1221 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

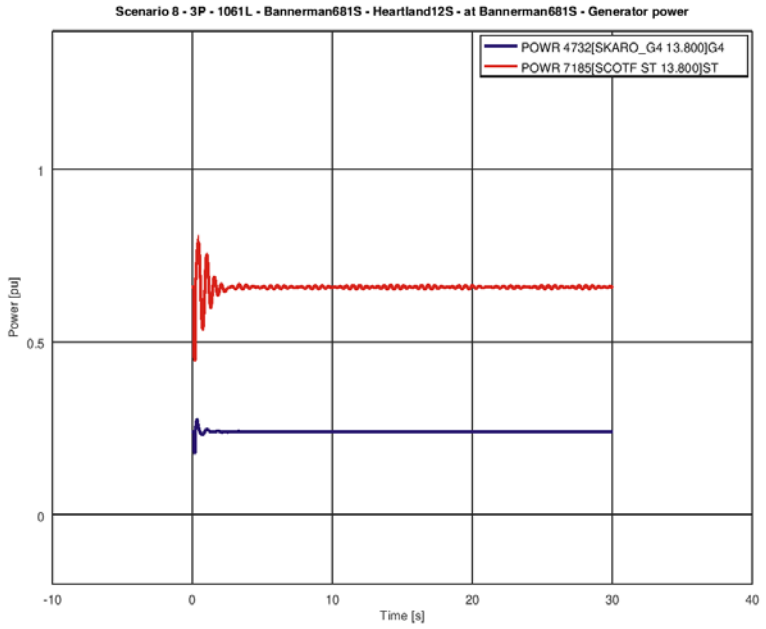


Figure A-1222 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

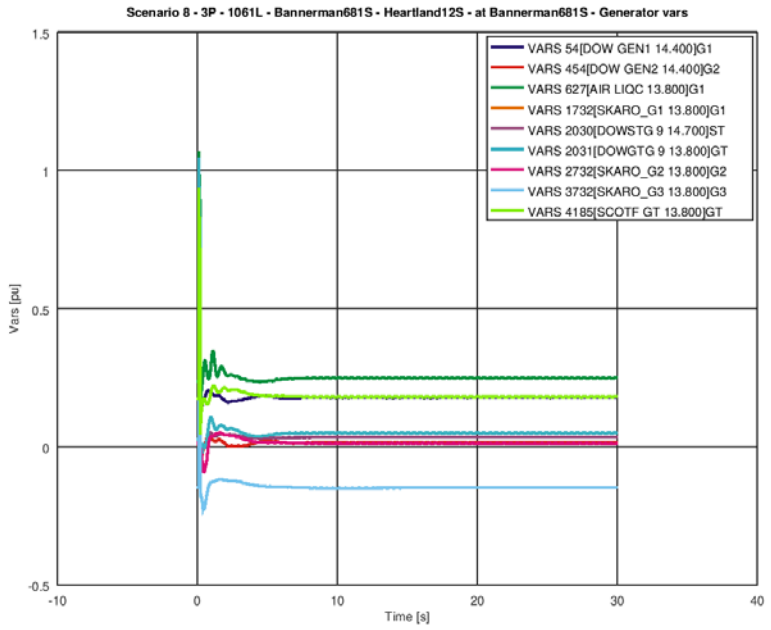


Figure A-1223 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

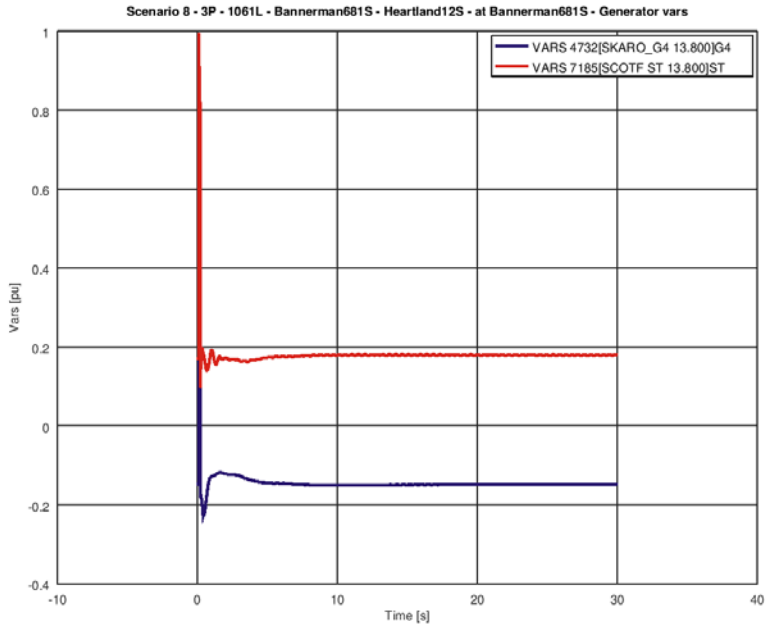


Figure A-1224 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

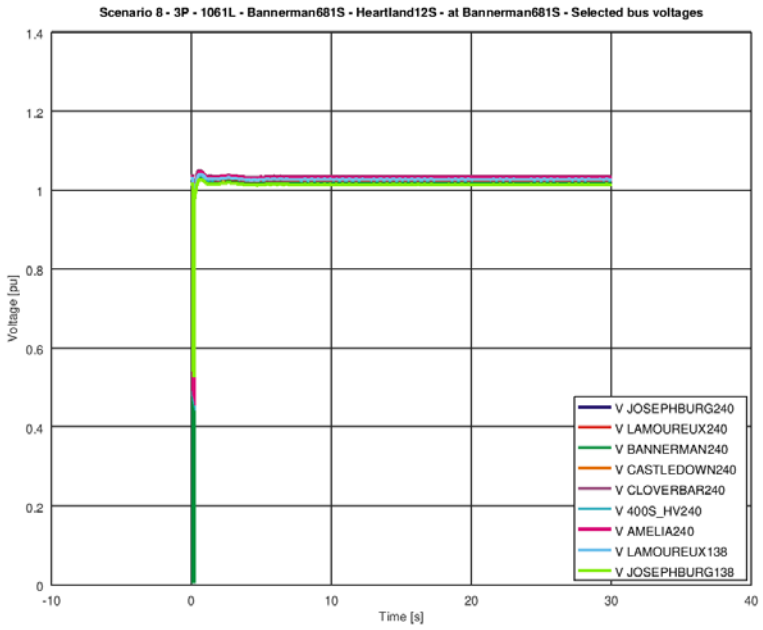


Figure A-1225 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

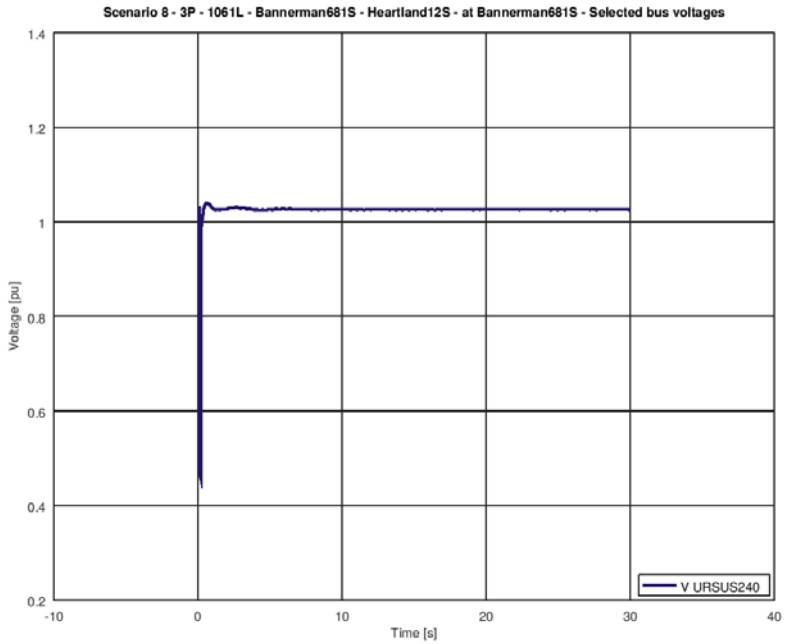


Figure A-1226 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

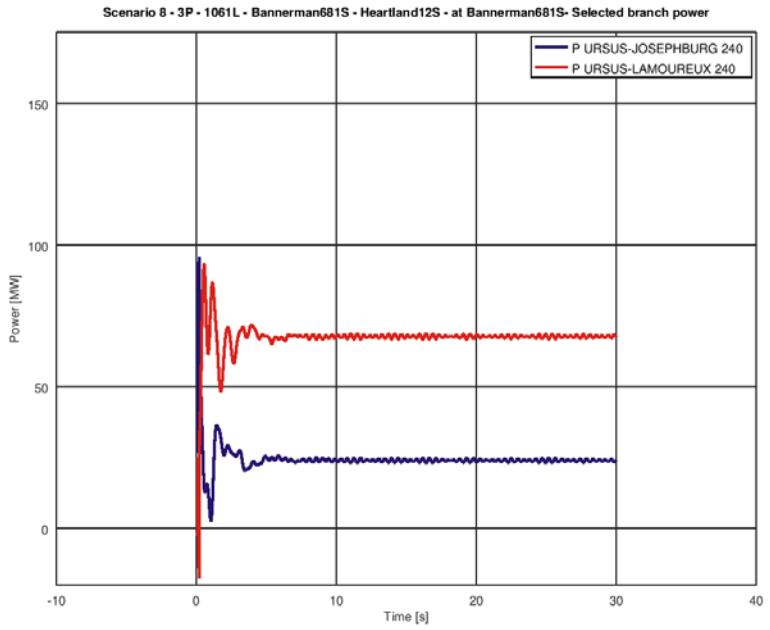


Figure A-1227 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

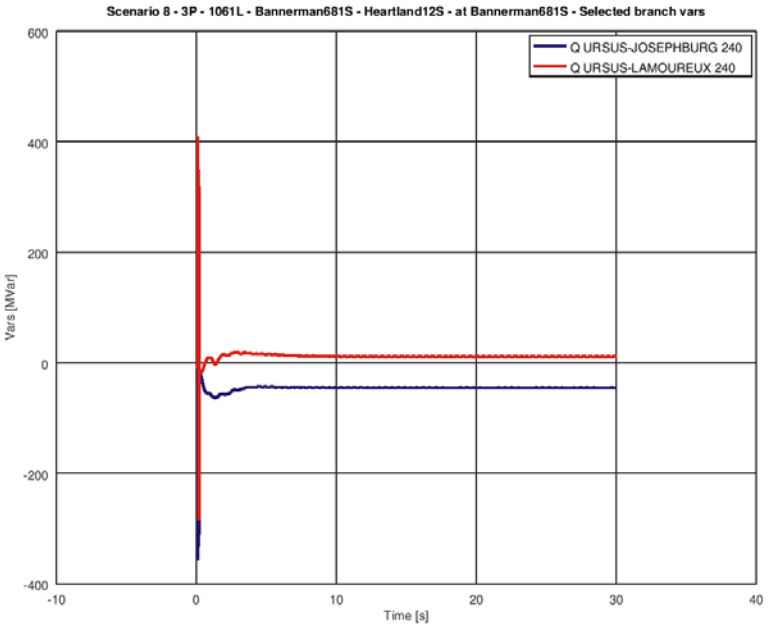


Figure A-1228 Scenario 8 - 3P - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

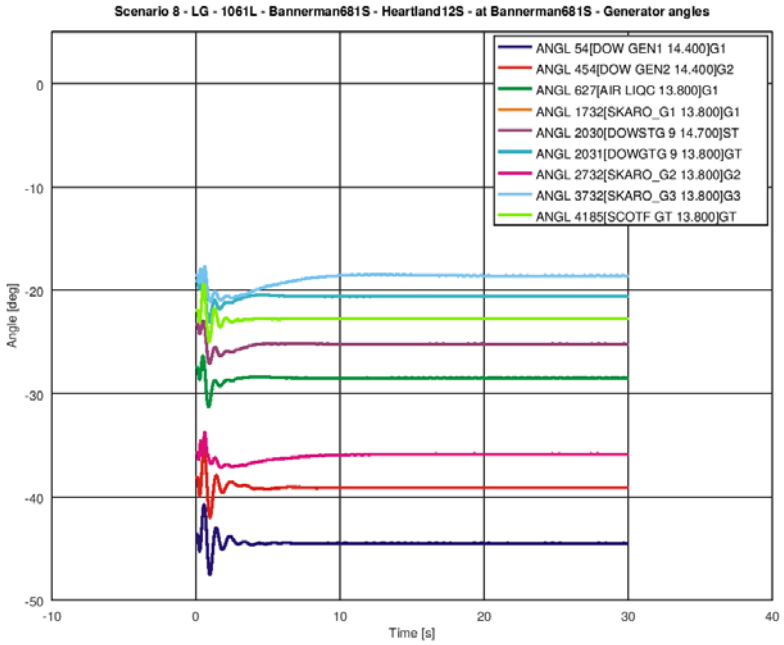


Figure A-1229 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

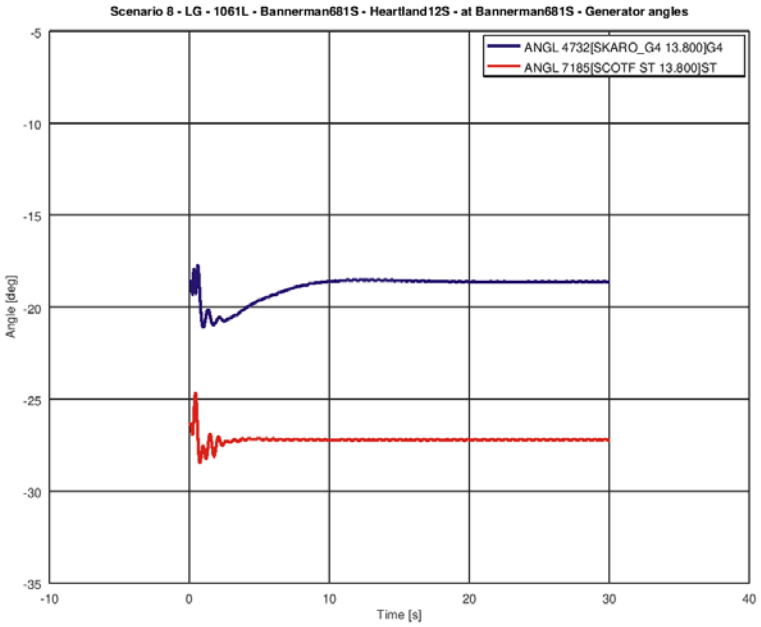


Figure A-1230 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator angles

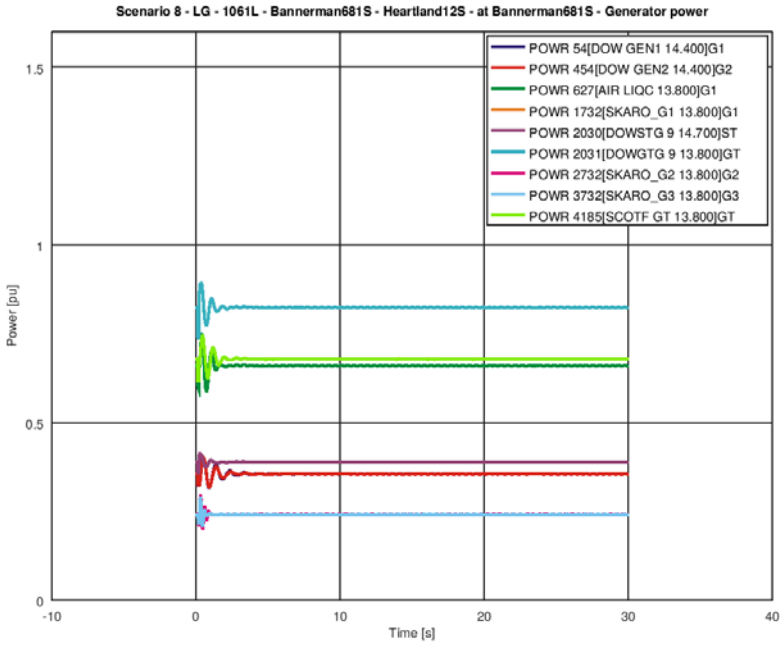


Figure A-1231 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

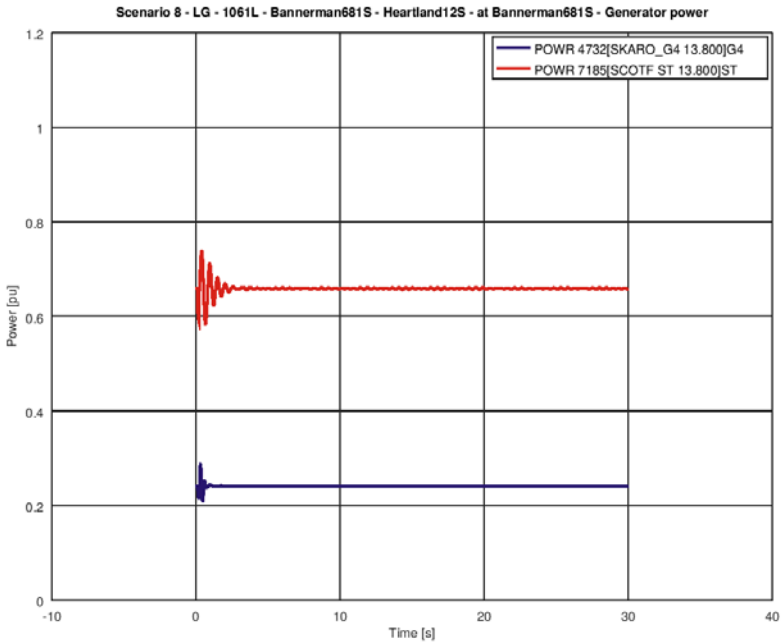


Figure A-1232 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator power

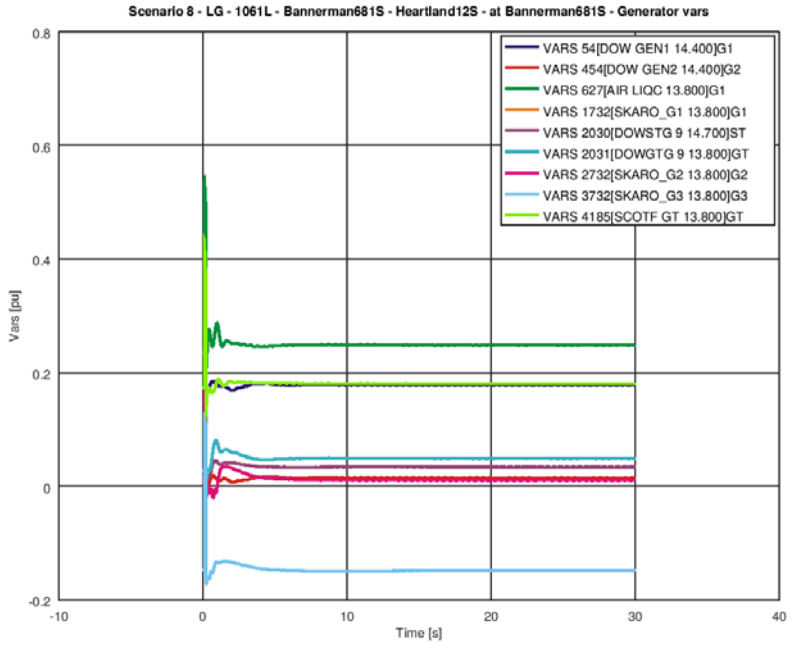


Figure A-1233 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

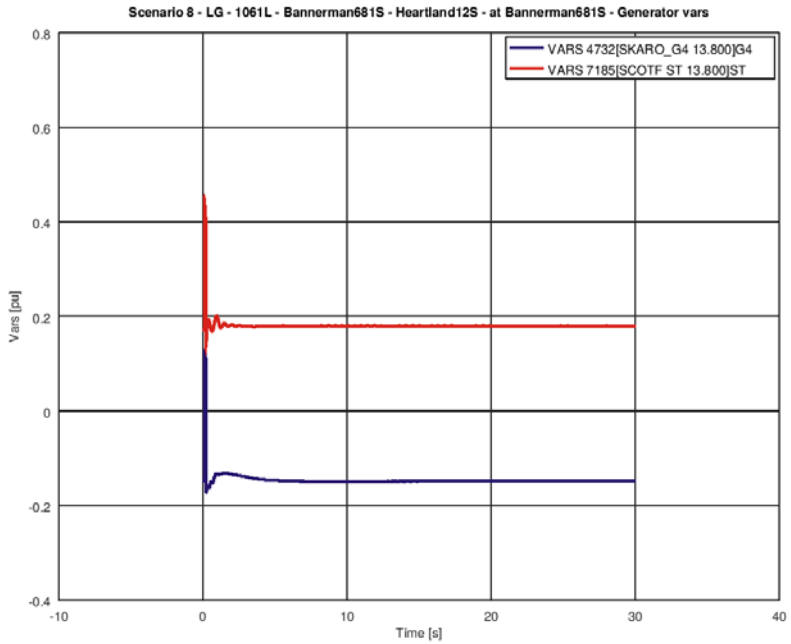


Figure A-1234 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Generator vars

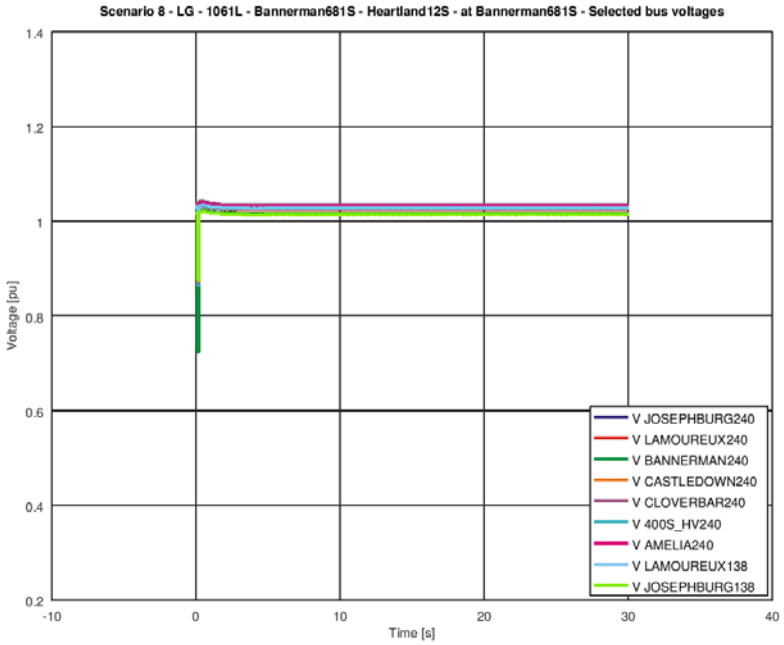


Figure A-1235 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

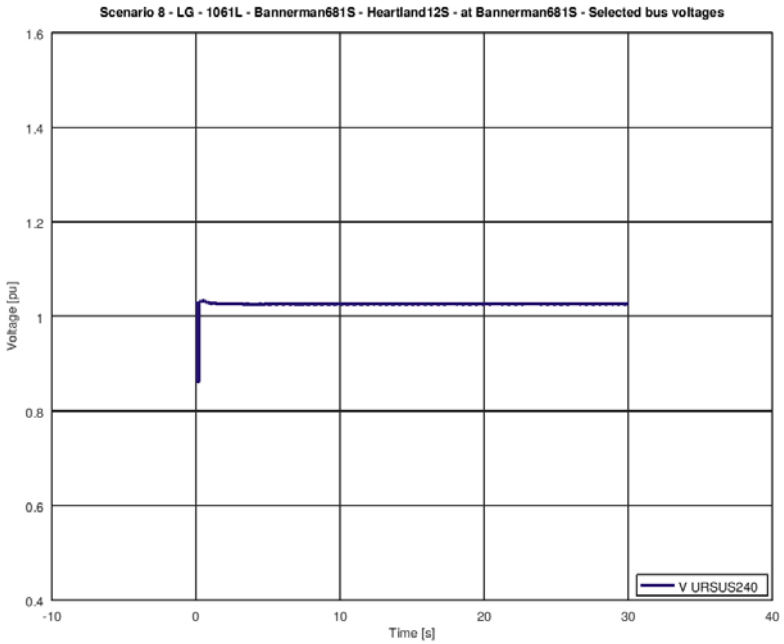


Figure A-1236 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected bus voltages

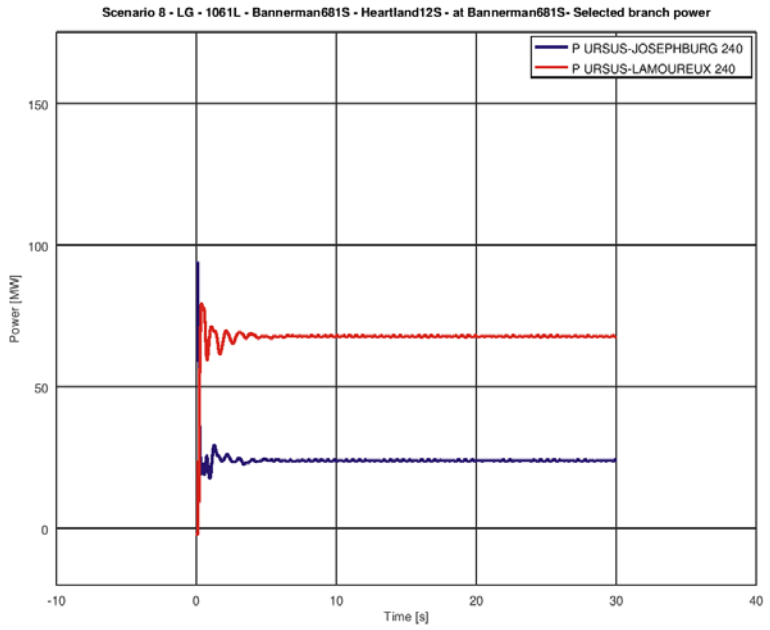


Figure A-1237 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch power

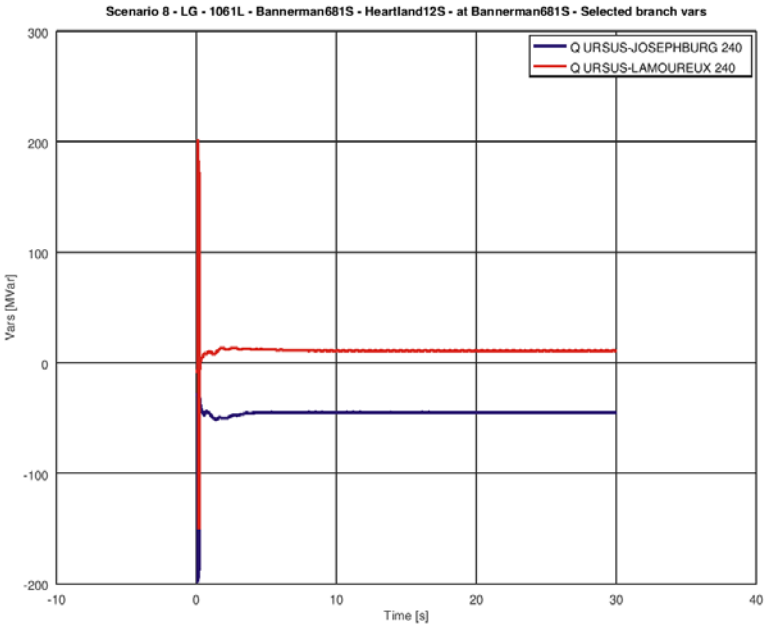


Figure A-1238 Scenario 8 - LG - 1061L - Bannerman681S - Heartland12S - at Bannerman681S - Selected branch vars

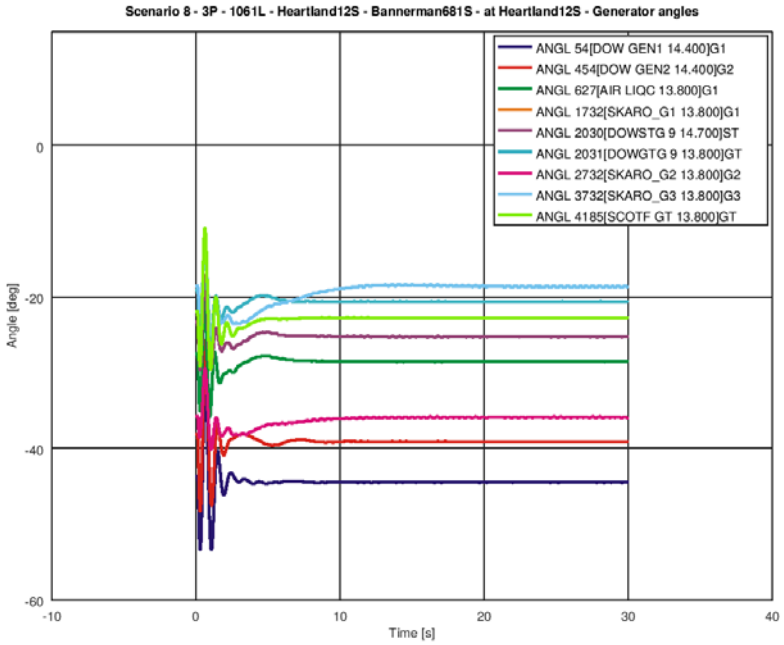


Figure A-1239 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

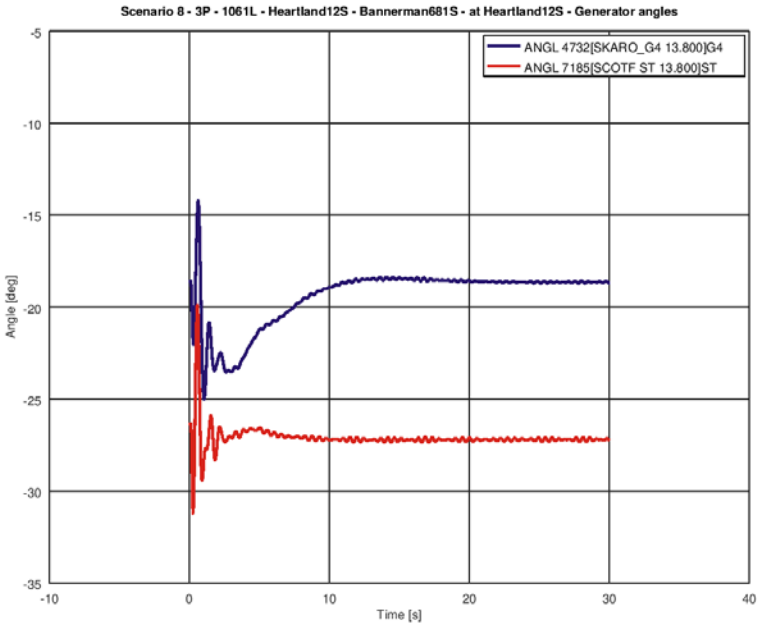


Figure A-1240 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

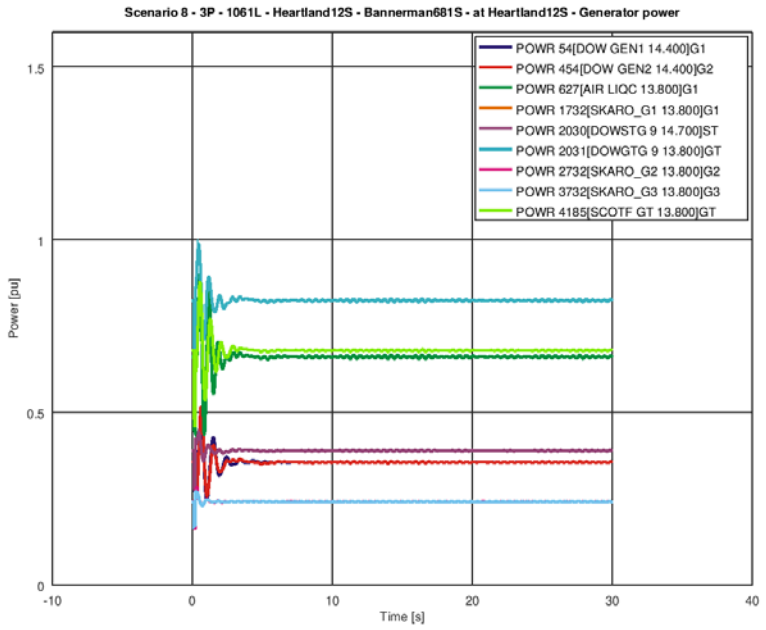


Figure A-1241 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

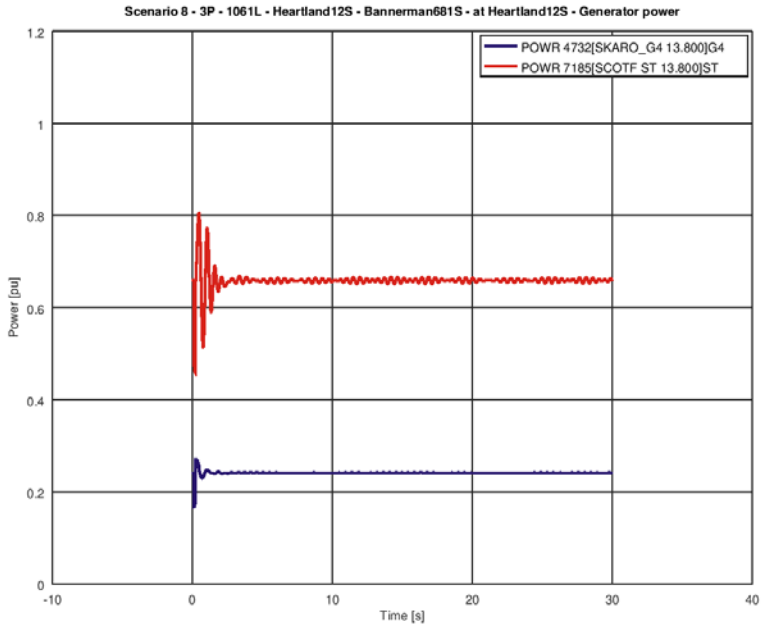


Figure A-1242 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

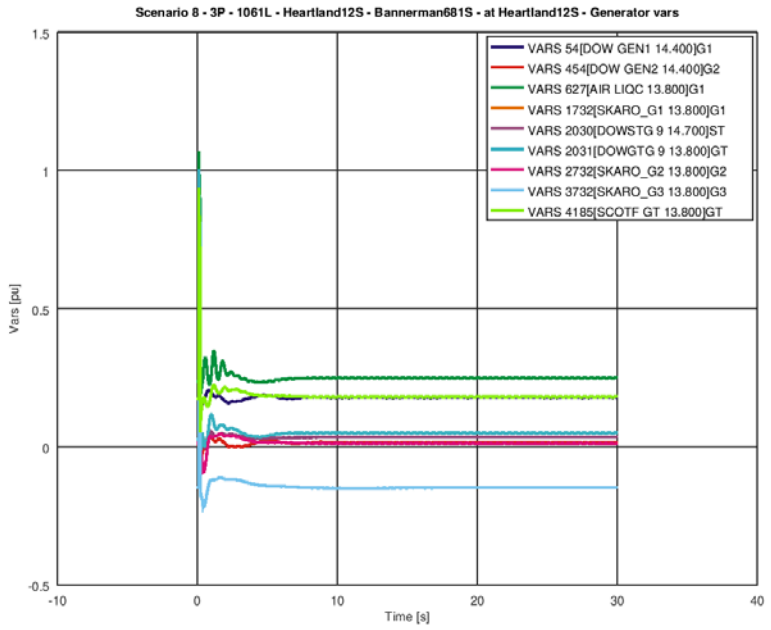


Figure A-1243 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

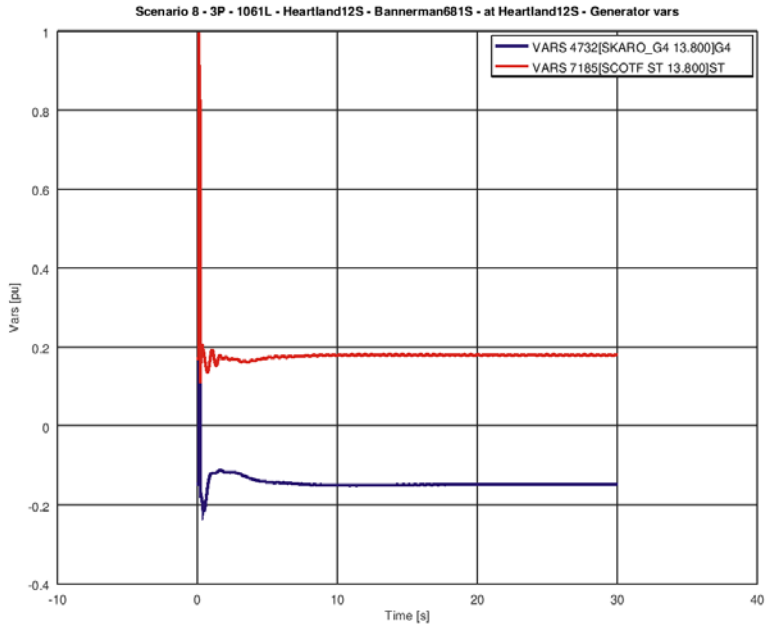


Figure A-1244 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

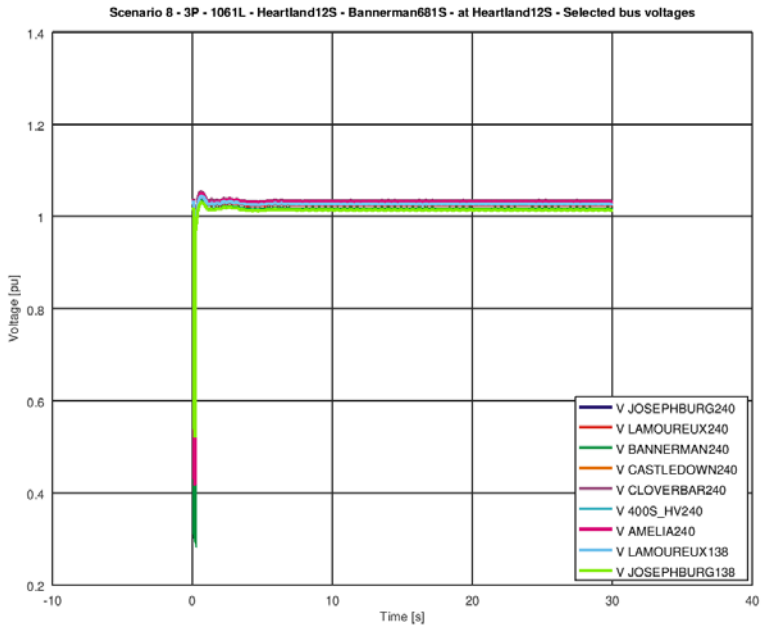


Figure A-1245 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

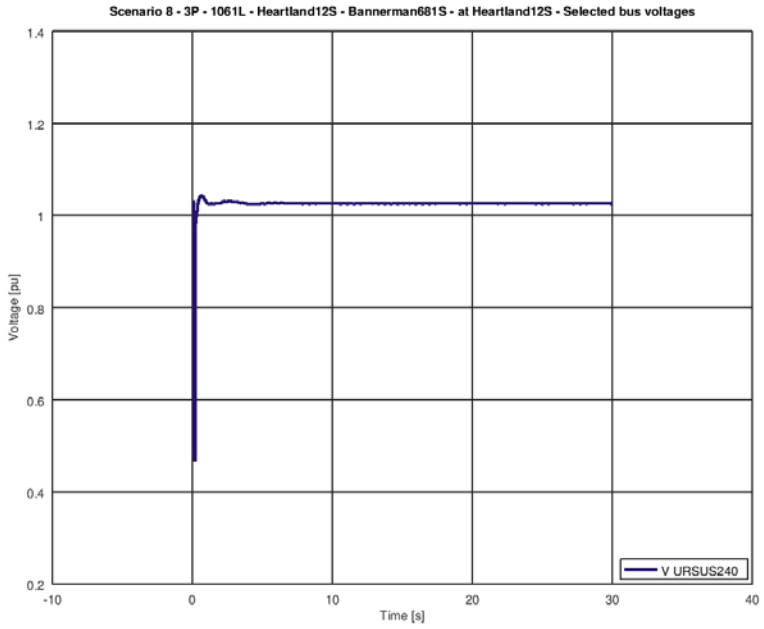


Figure A-1246 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

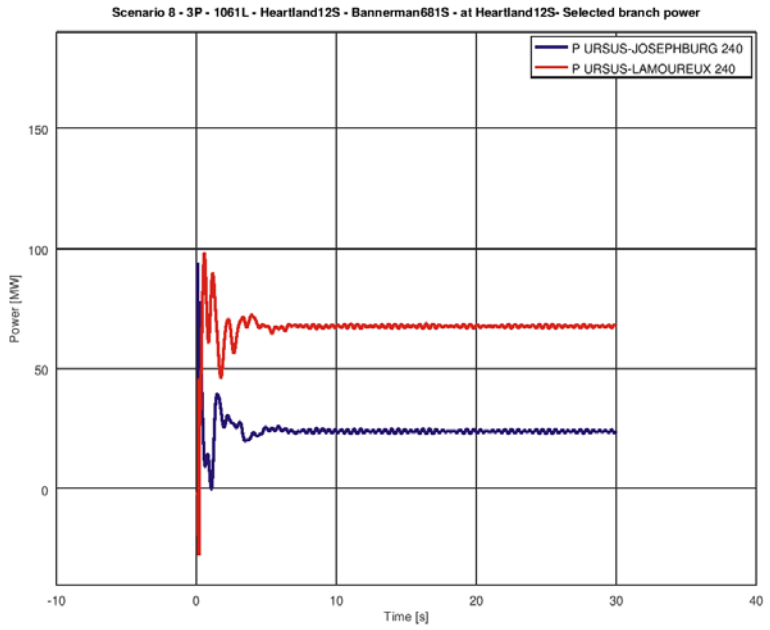


Figure A-1247 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

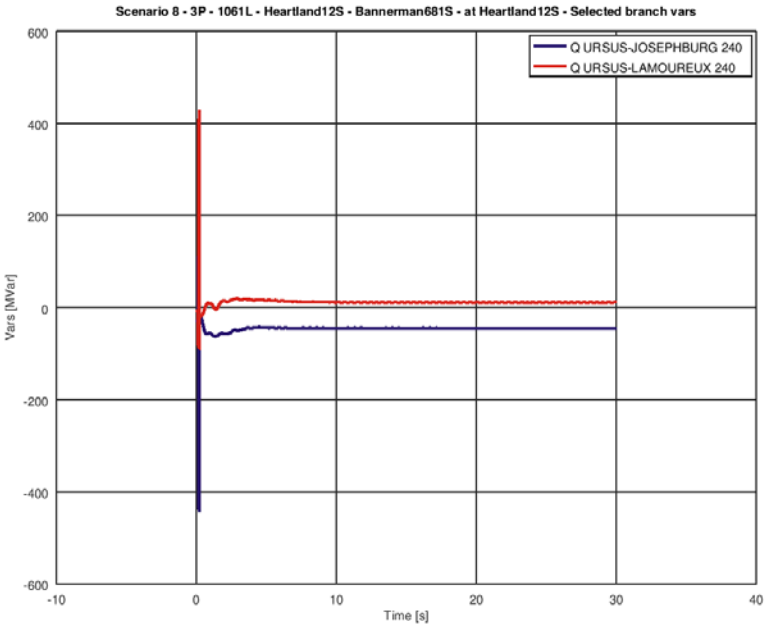


Figure A-1248 Scenario 8 - 3P - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

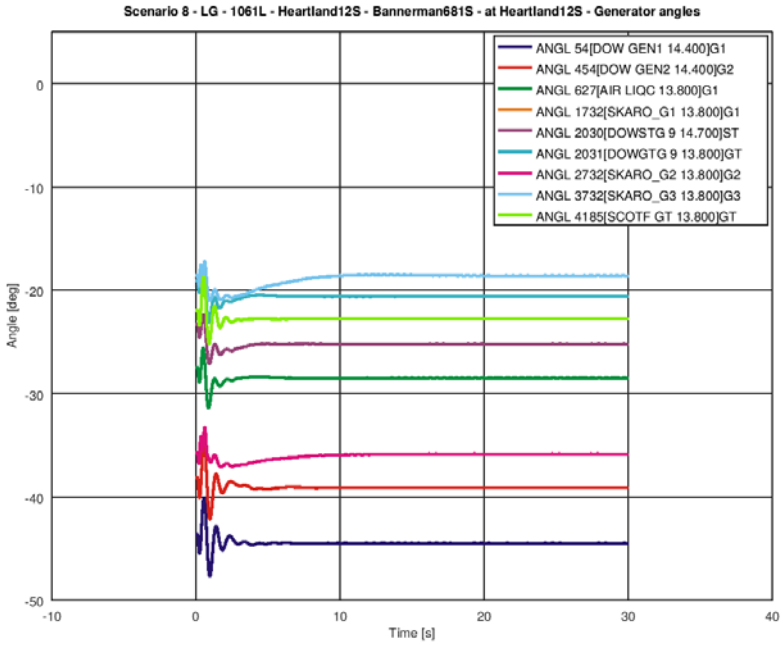


Figure A-1249 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

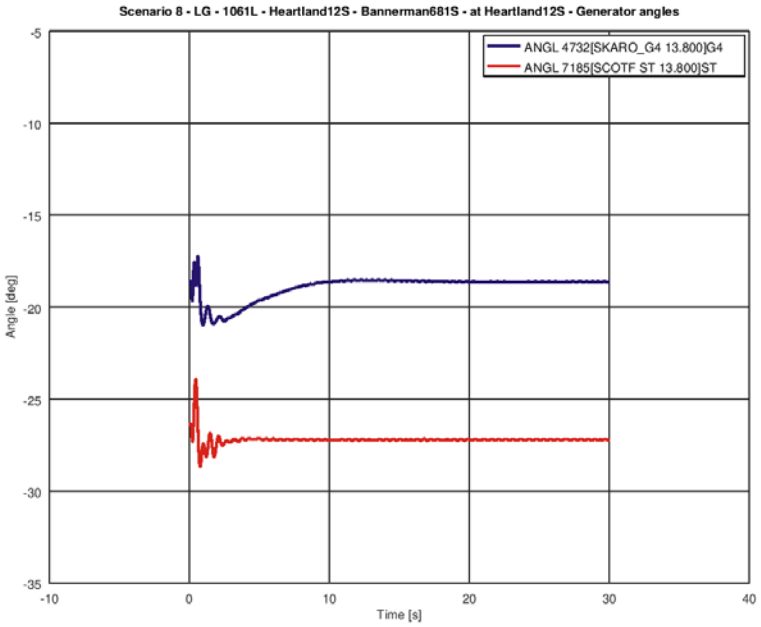


Figure A-1250 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator angles

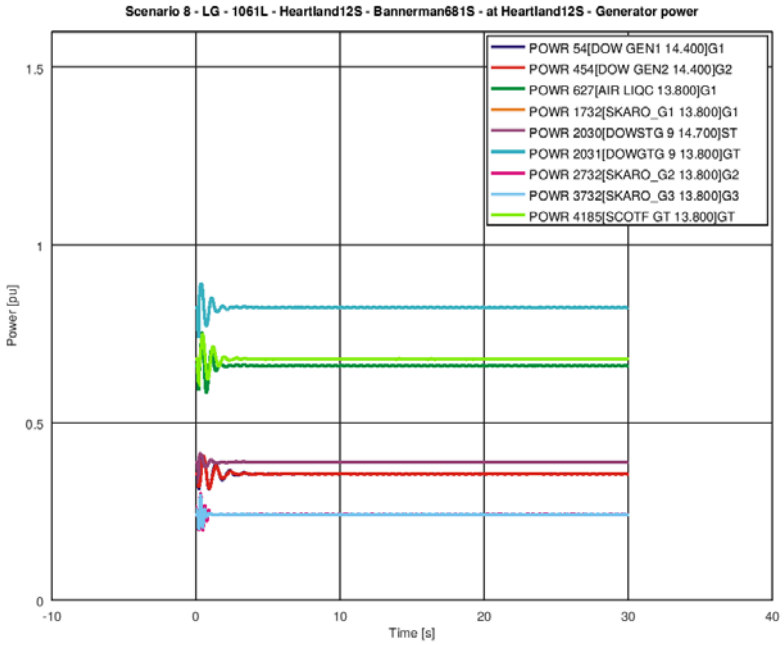


Figure A-1251 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

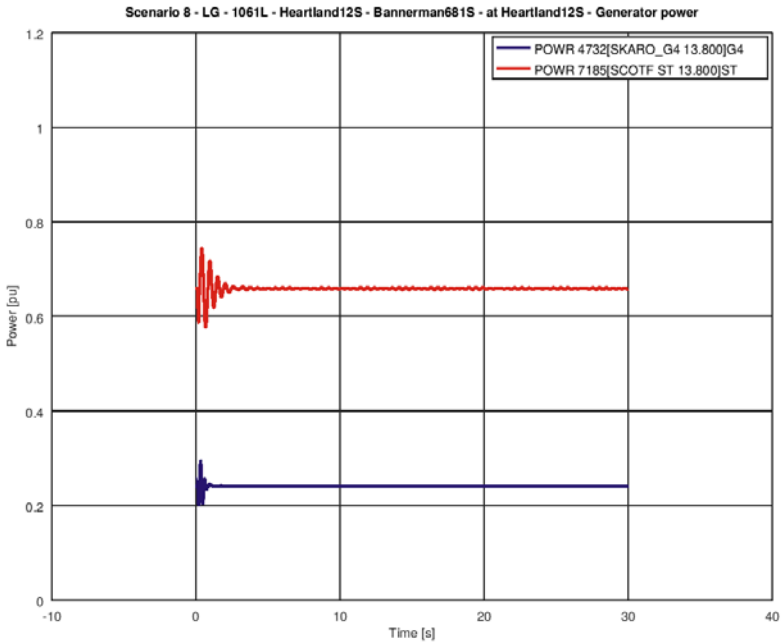


Figure A-1252 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator power

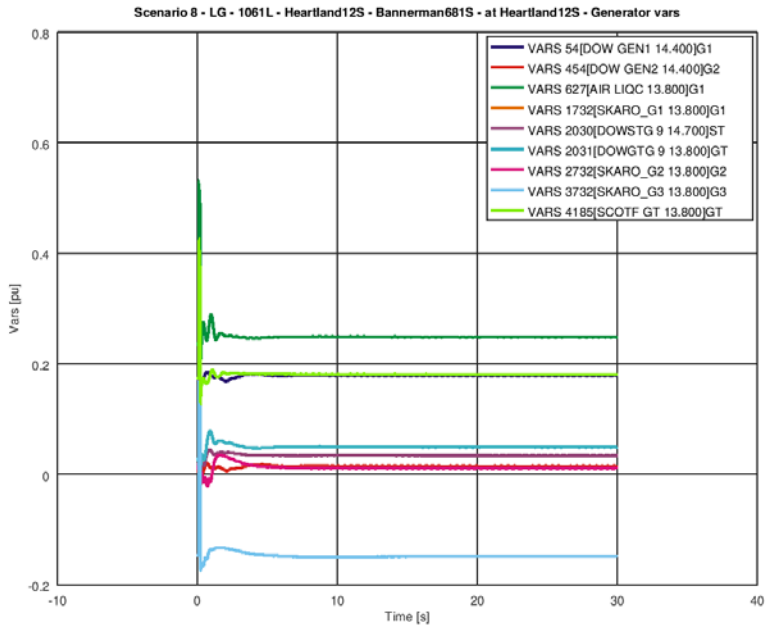


Figure A-1253 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

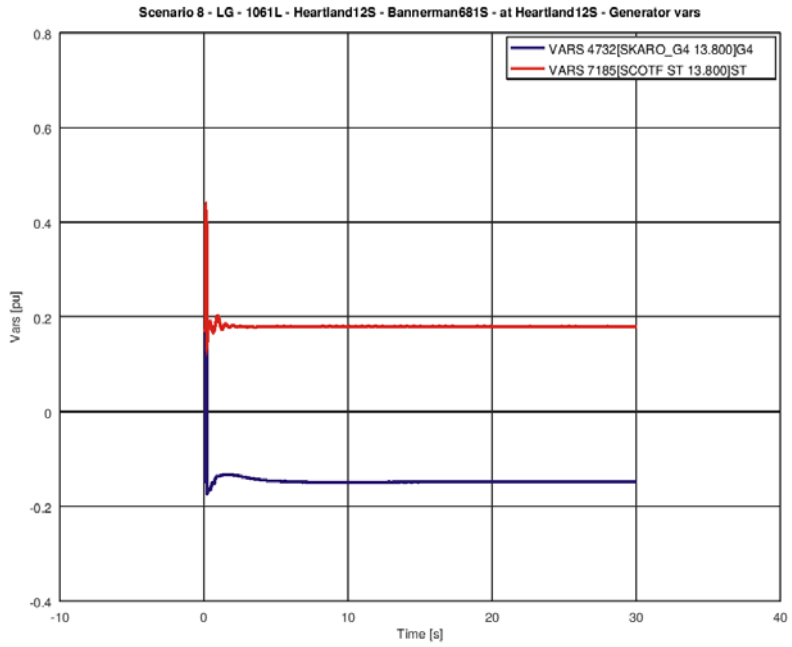


Figure A-1254 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Generator vars

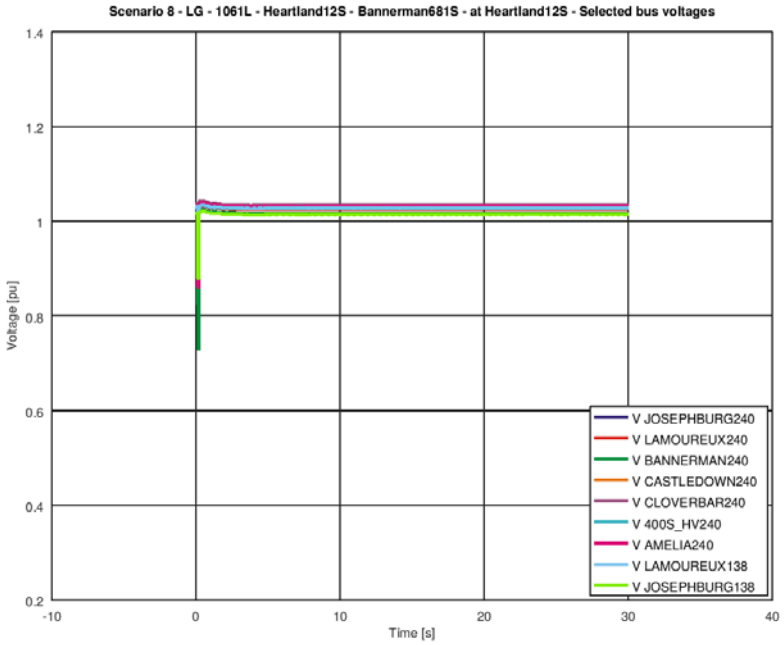


Figure A-1255 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

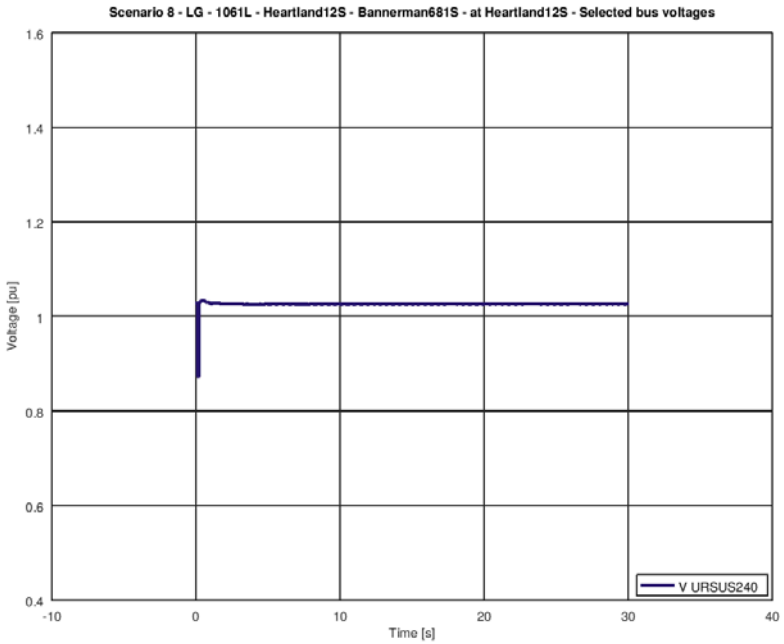


Figure A-1256 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected bus voltages

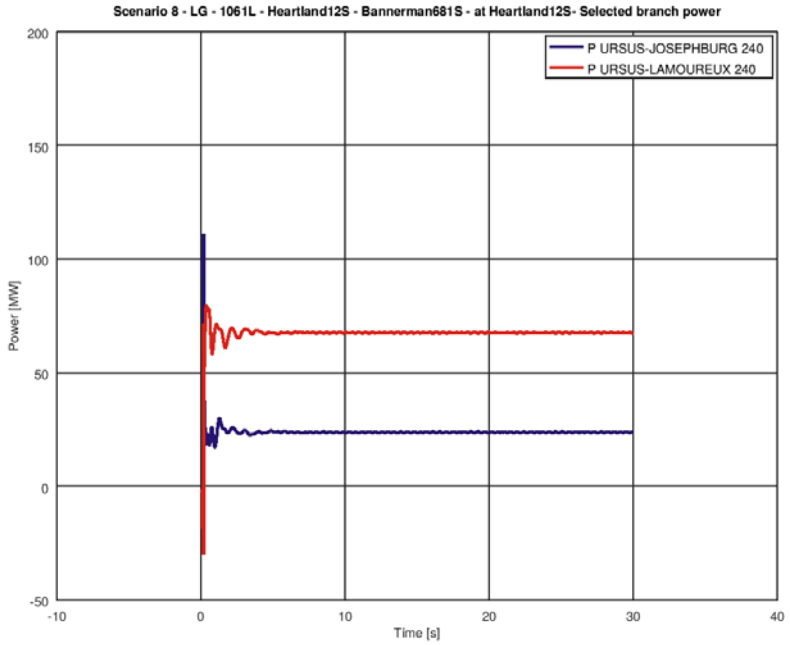


Figure A-1257 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch power

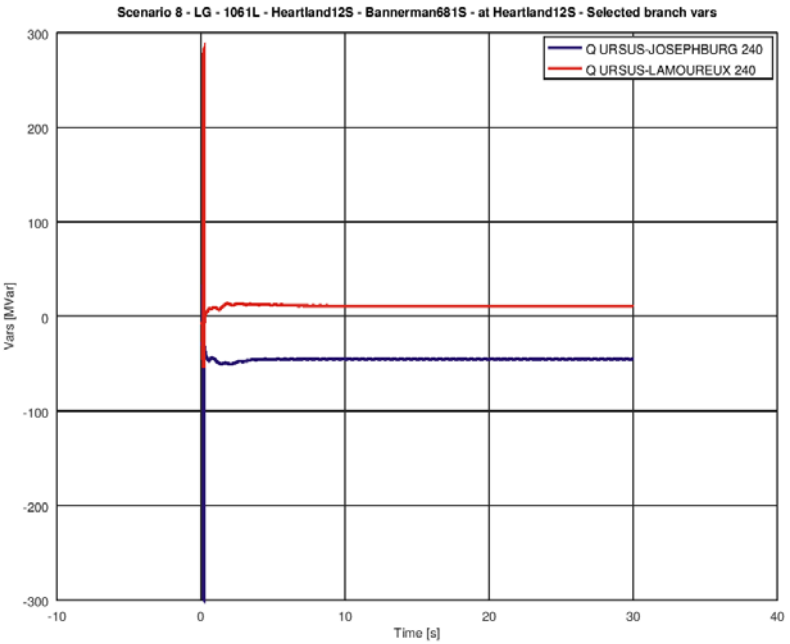


Figure A-1258 Scenario 8 - LG - 1061L - Heartland12S - Bannerman681S - at Heartland12S - Selected branch vars

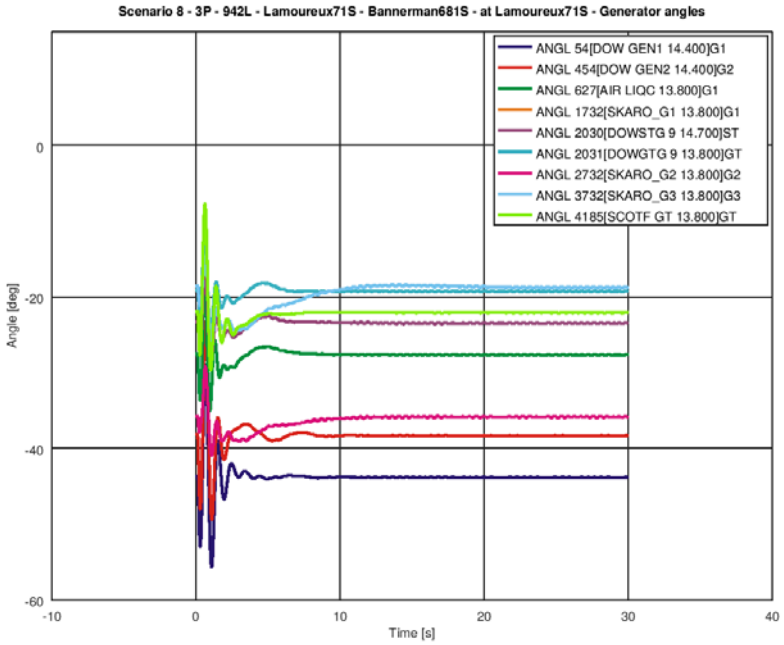


Figure A-1259 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

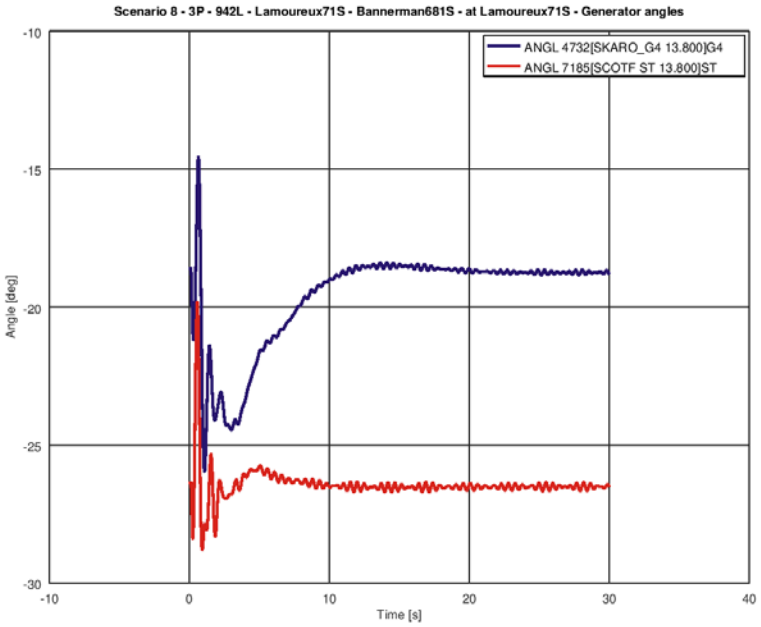


Figure A-1260 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

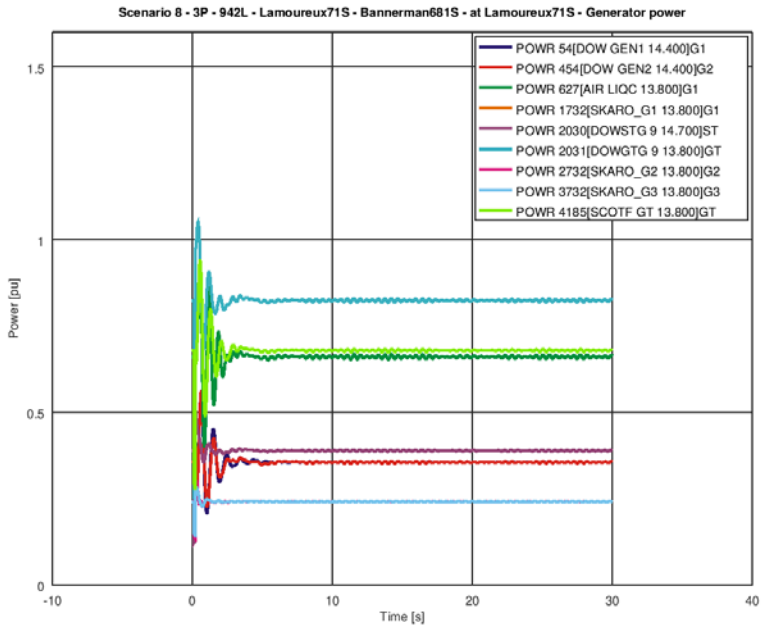


Figure A-1261 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

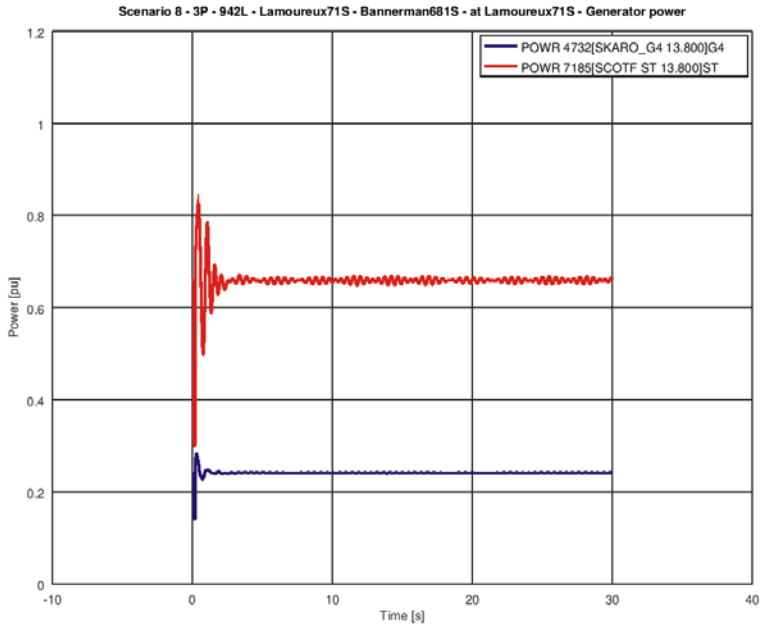


Figure A-1262 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

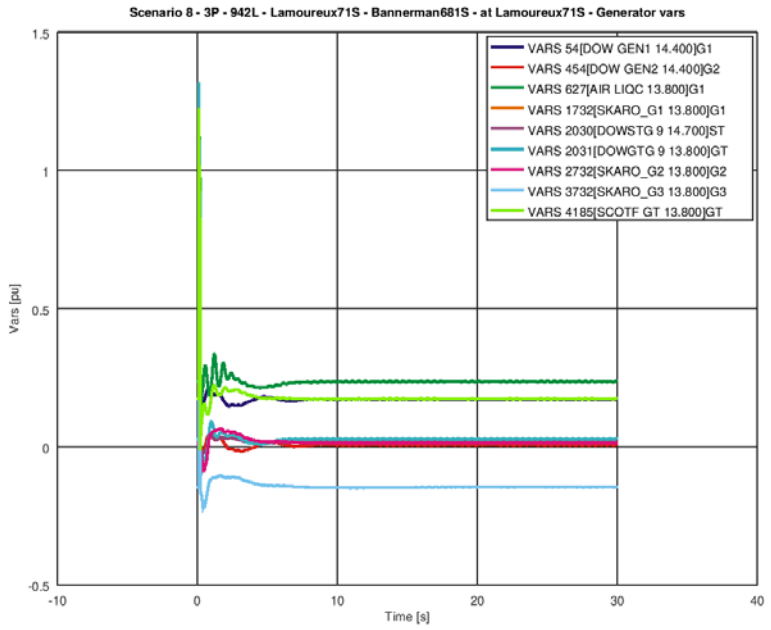


Figure A-1263 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

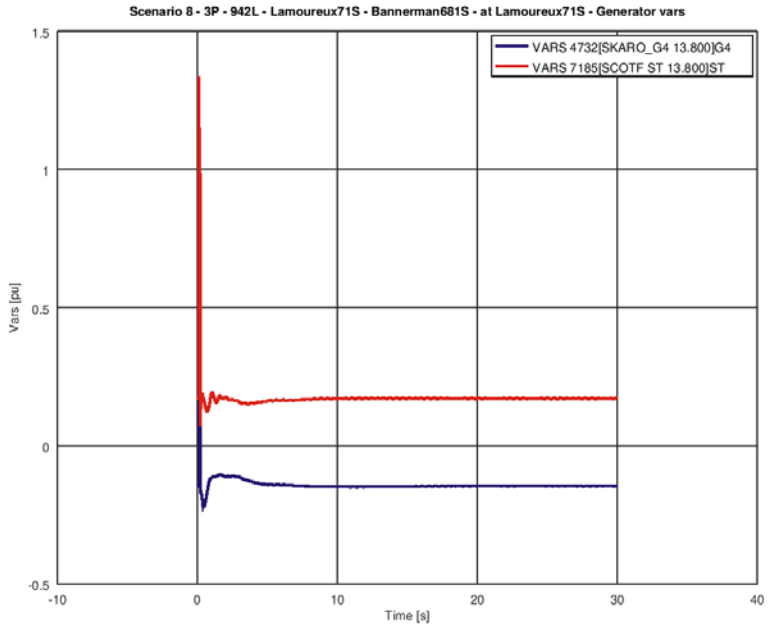


Figure A-1264 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

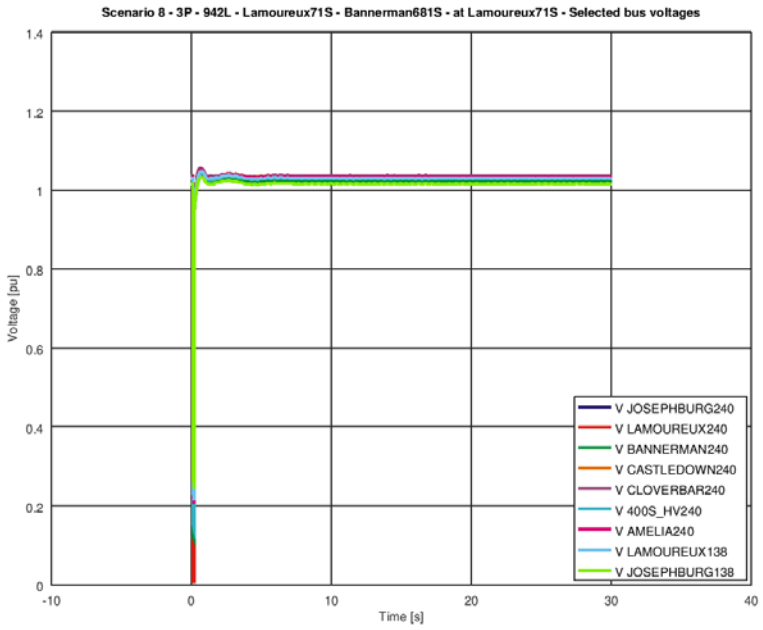


Figure A-1265 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

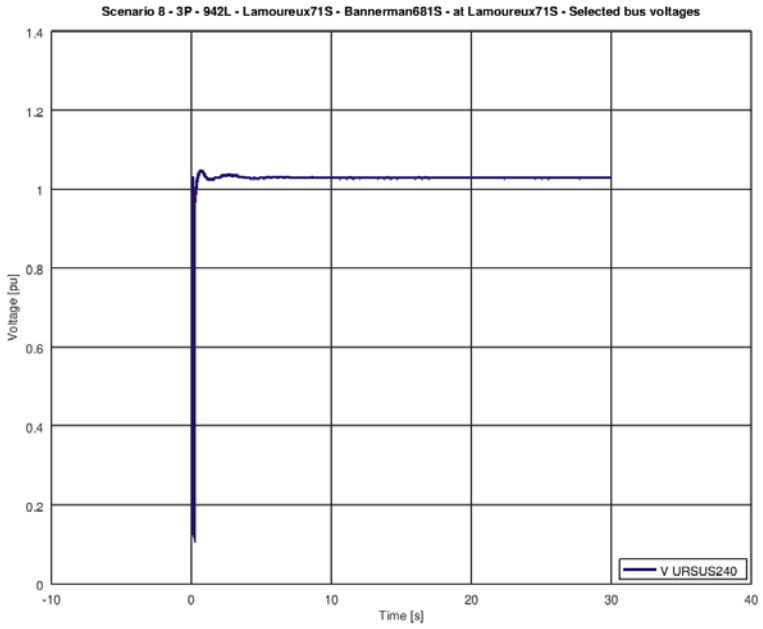


Figure A-1266 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

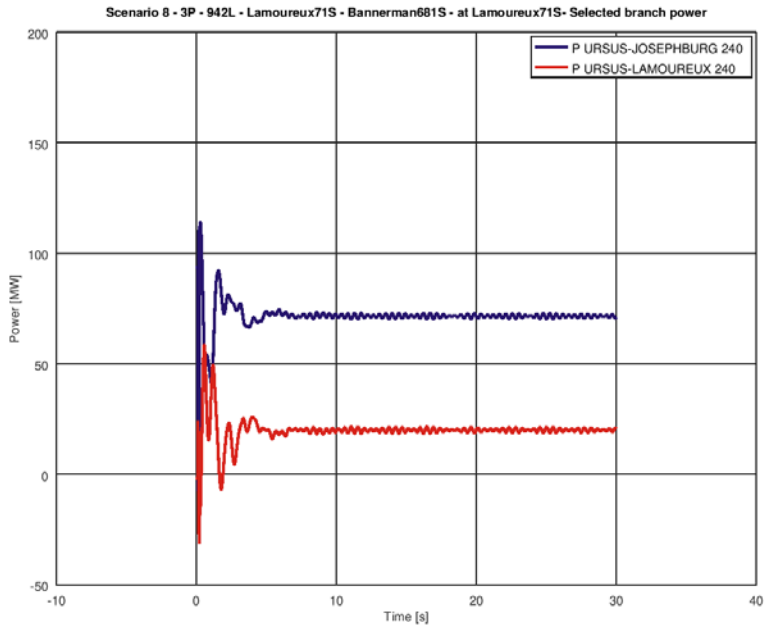


Figure A-1267 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

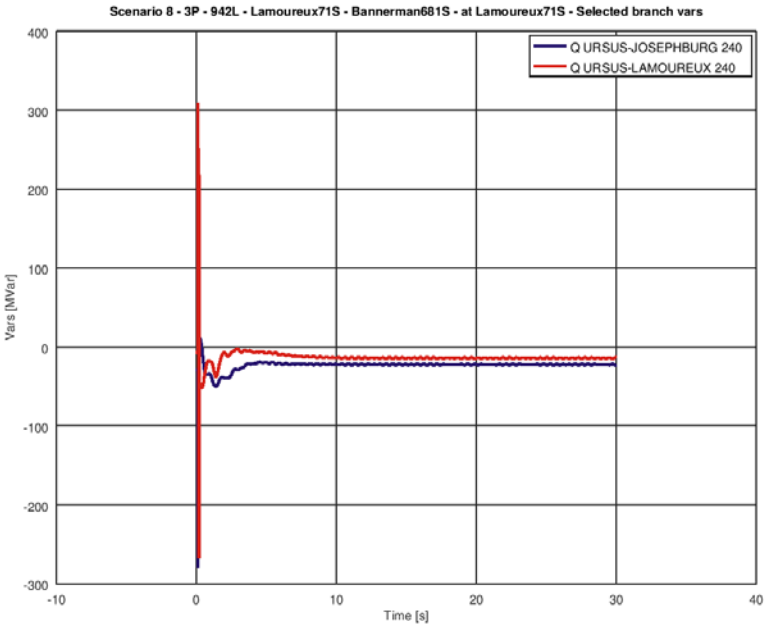


Figure A-1268 Scenario 8 - 3P - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

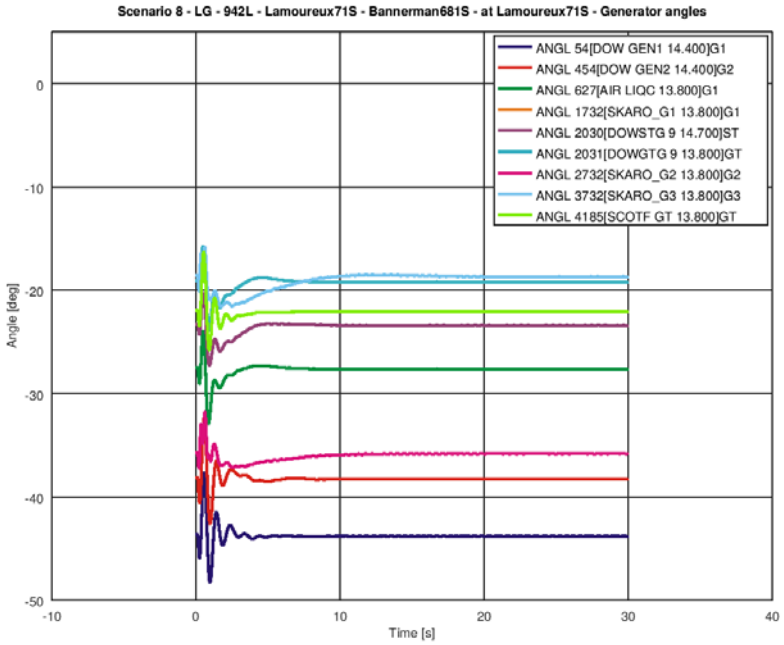


Figure A-1269 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

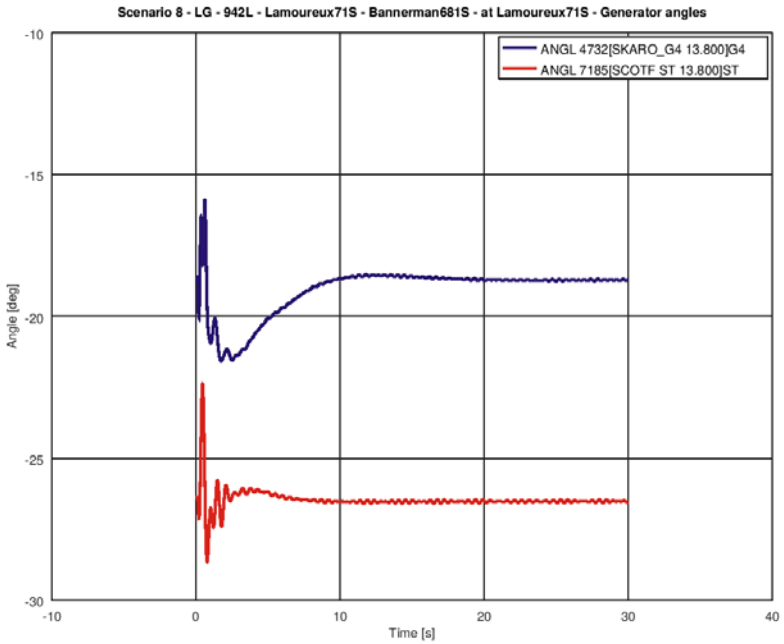


Figure A-1270 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator angles

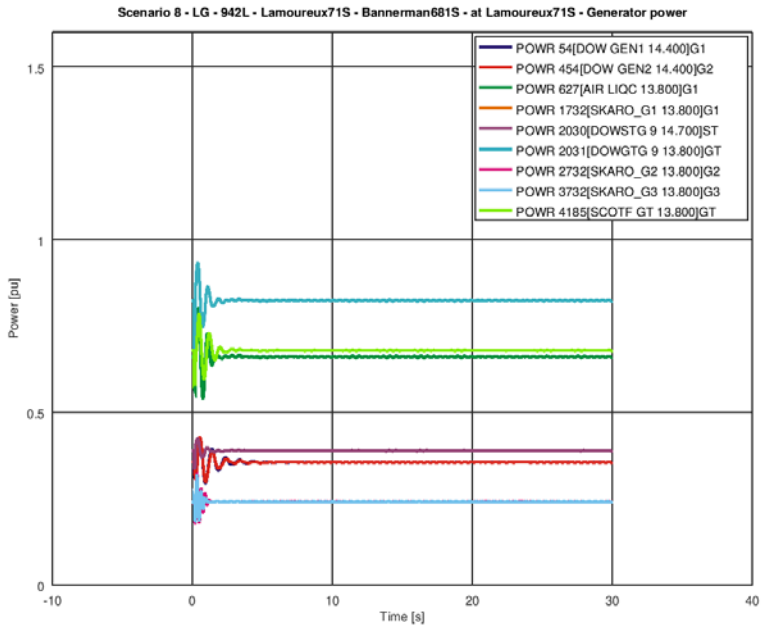


Figure A-1271 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

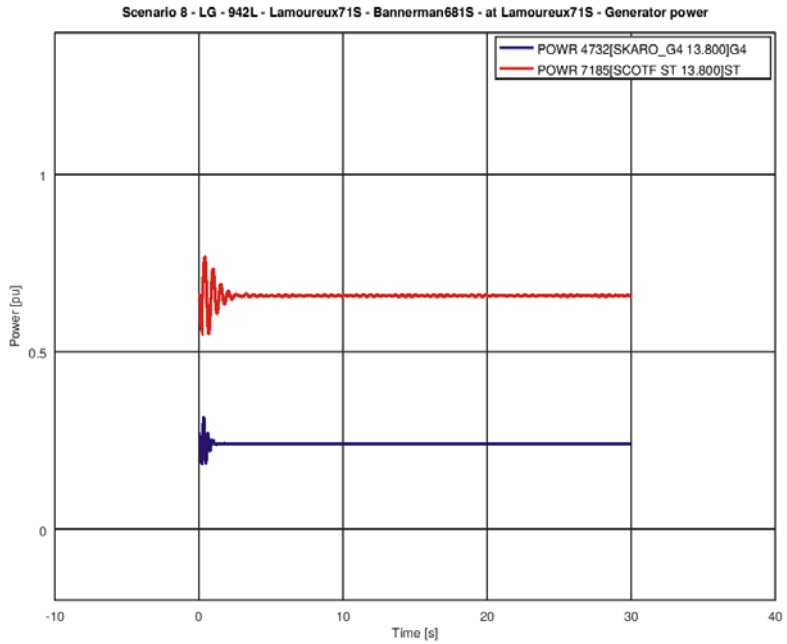


Figure A-1272 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator power

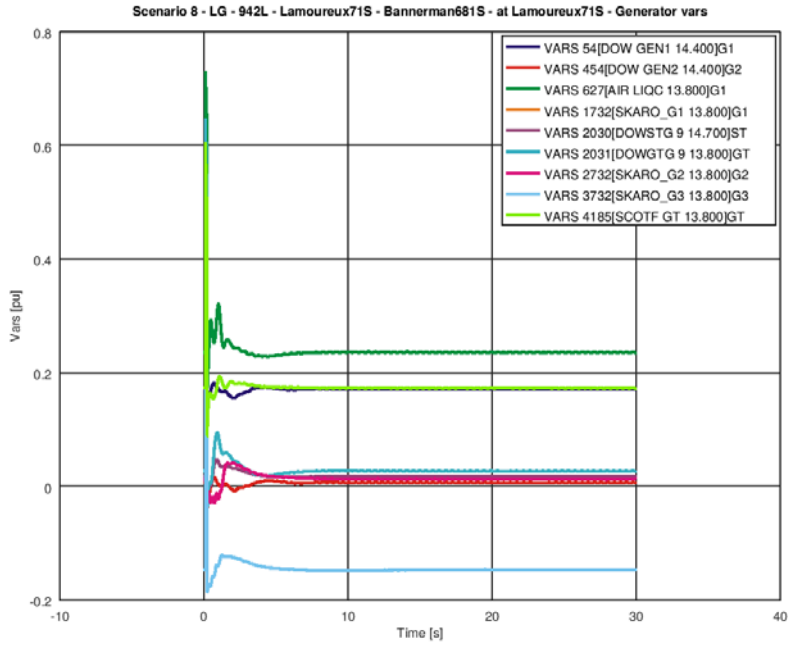


Figure A-1273 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

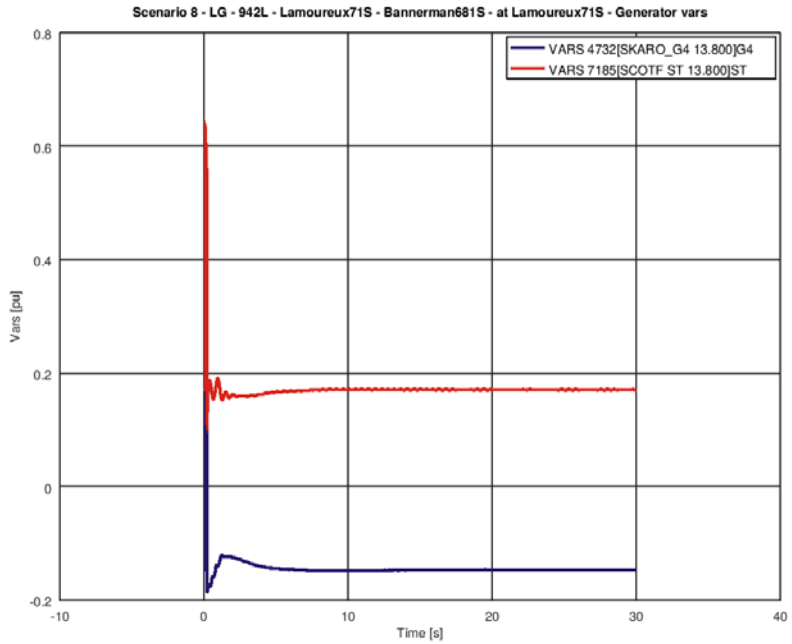


Figure A-1274 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Generator vars

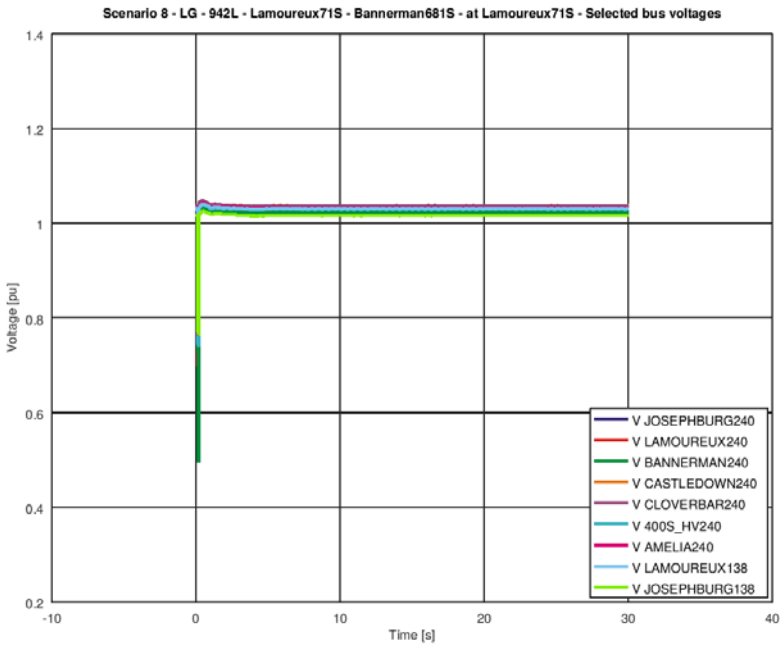


Figure A-1275 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

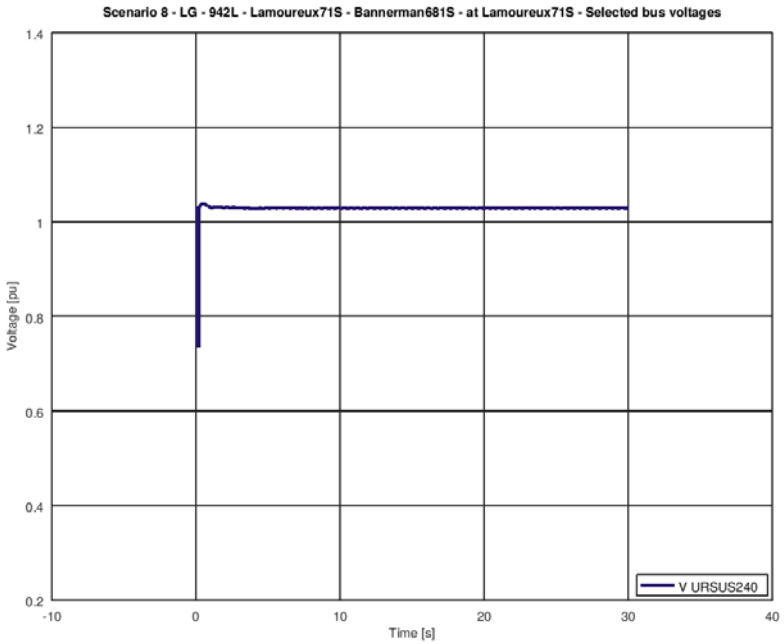


Figure A-1276 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected bus voltages

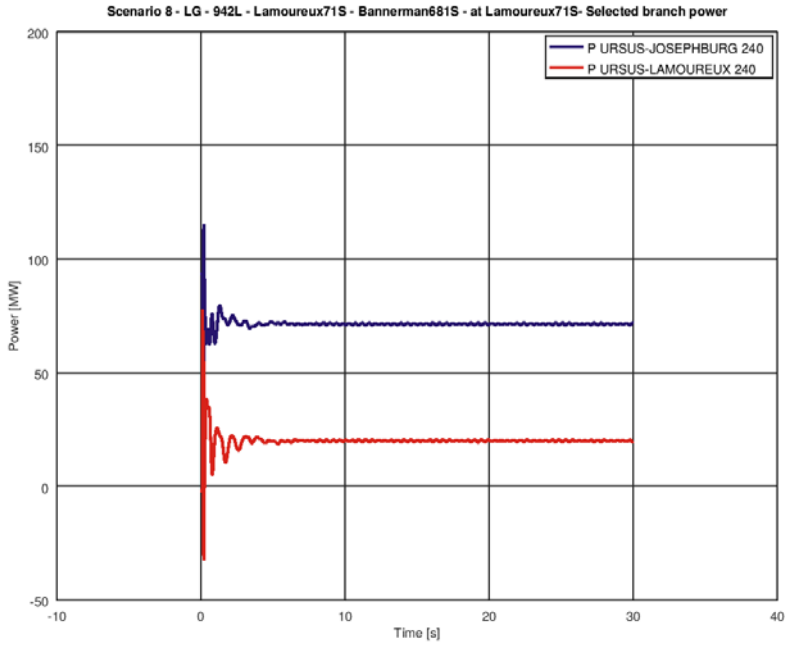


Figure A-1277 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch power

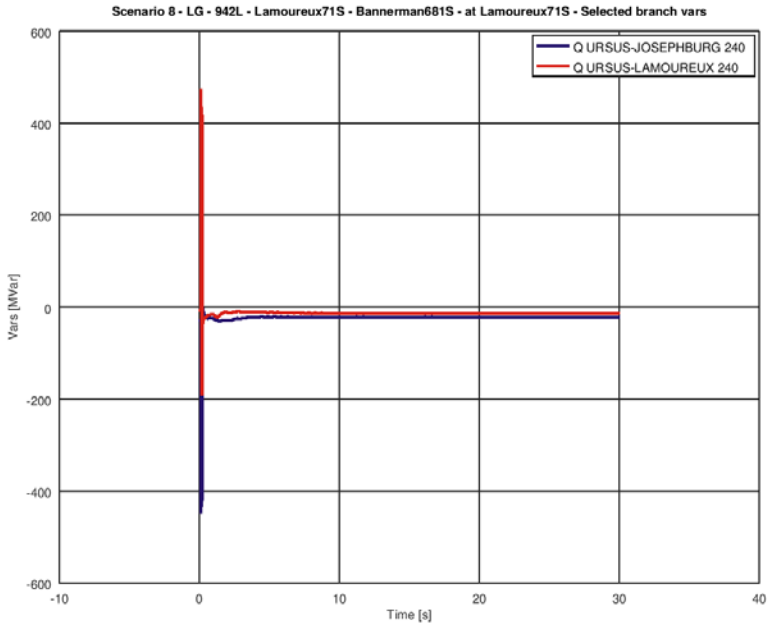


Figure A-1278 Scenario 8 - LG - 942L - Lamoureux71S - Bannerman681S - at Lamoureux71S - Selected branch vars

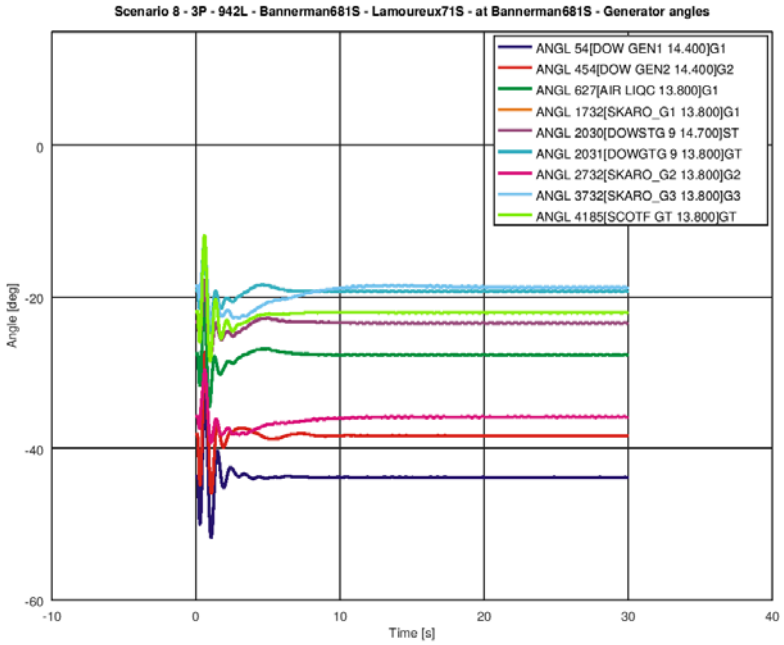


Figure A-1279 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

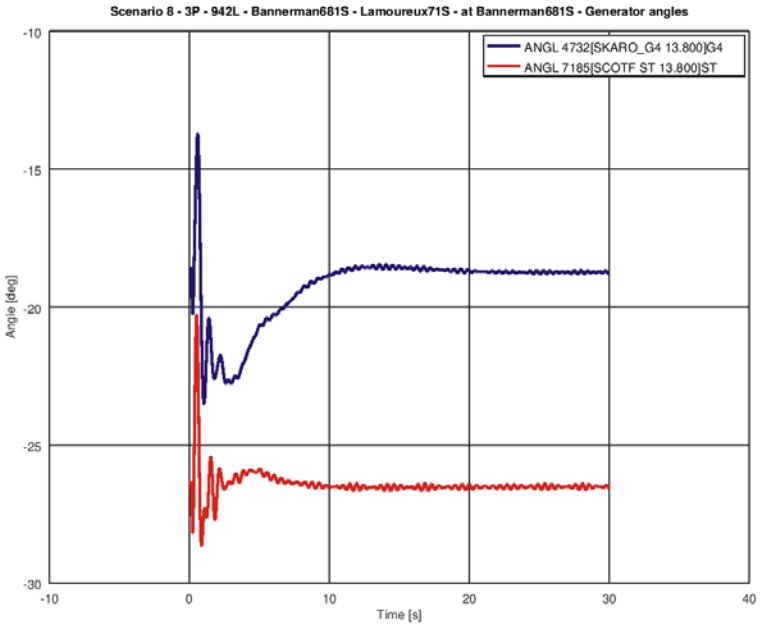


Figure A-1280 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

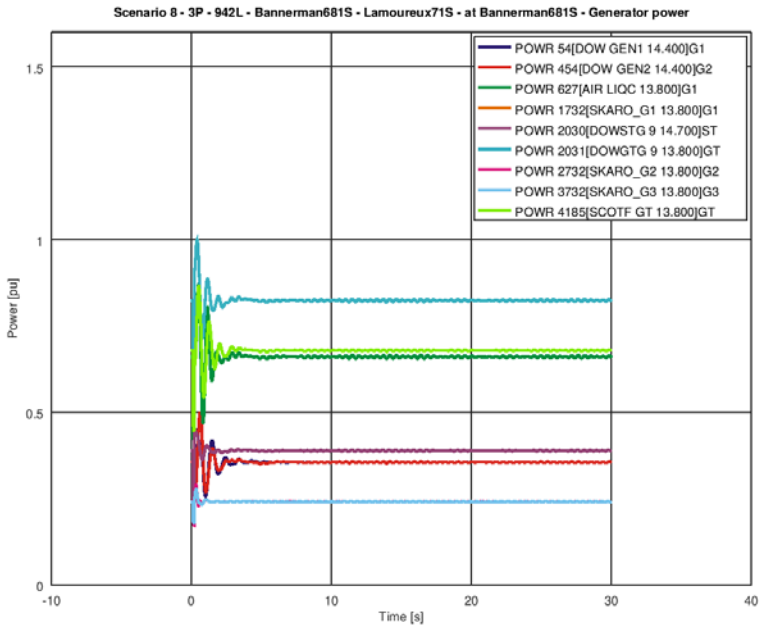


Figure A-1281 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

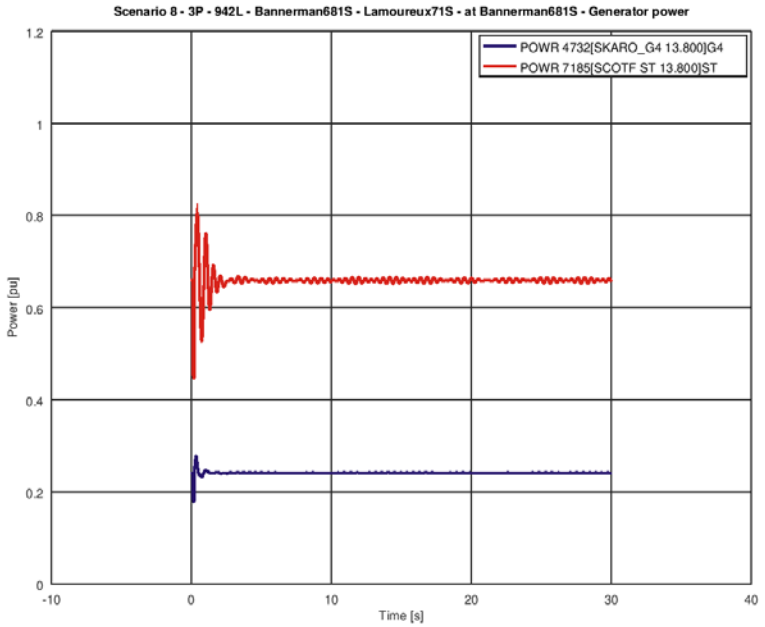


Figure A-1282 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

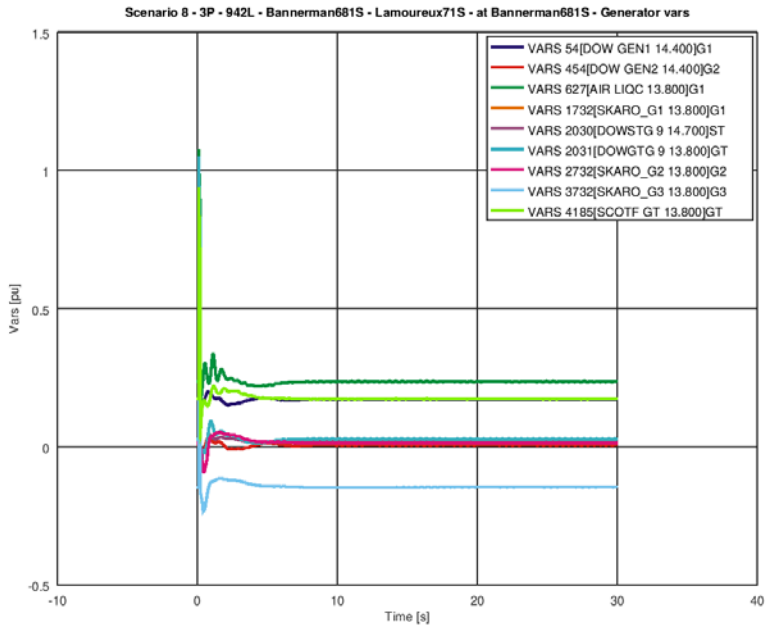


Figure A-1283 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

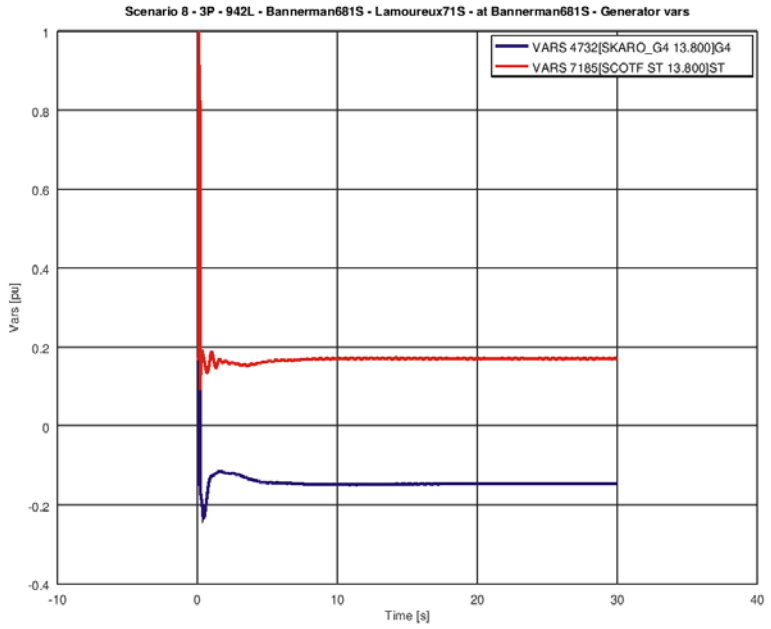


Figure A-1284 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

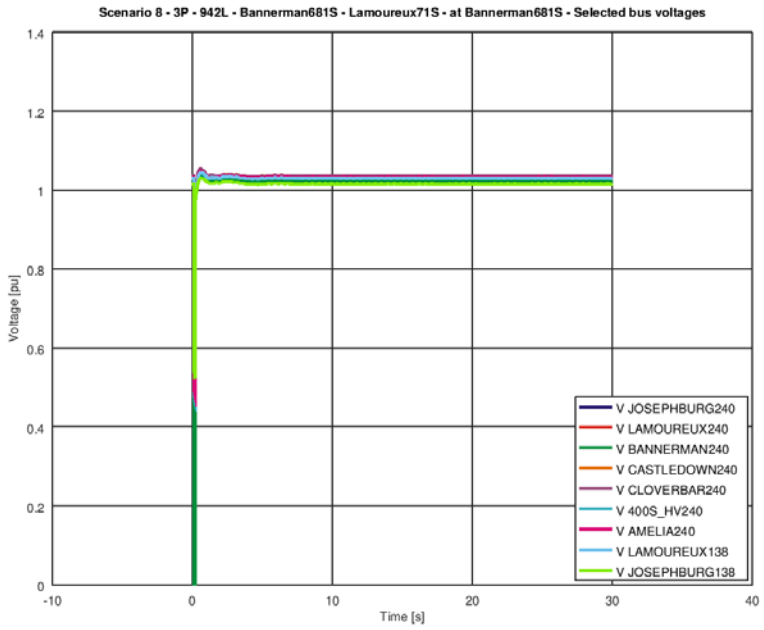


Figure A-1285 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

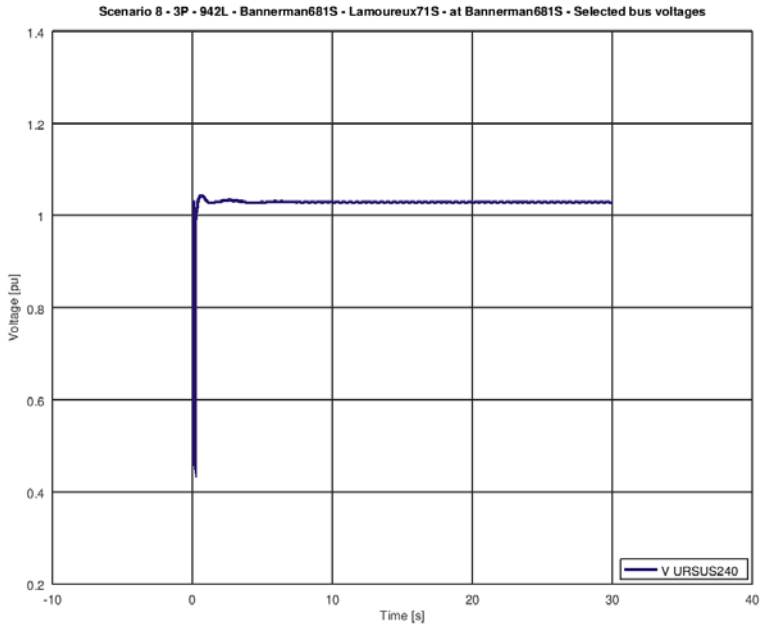


Figure A-1286 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

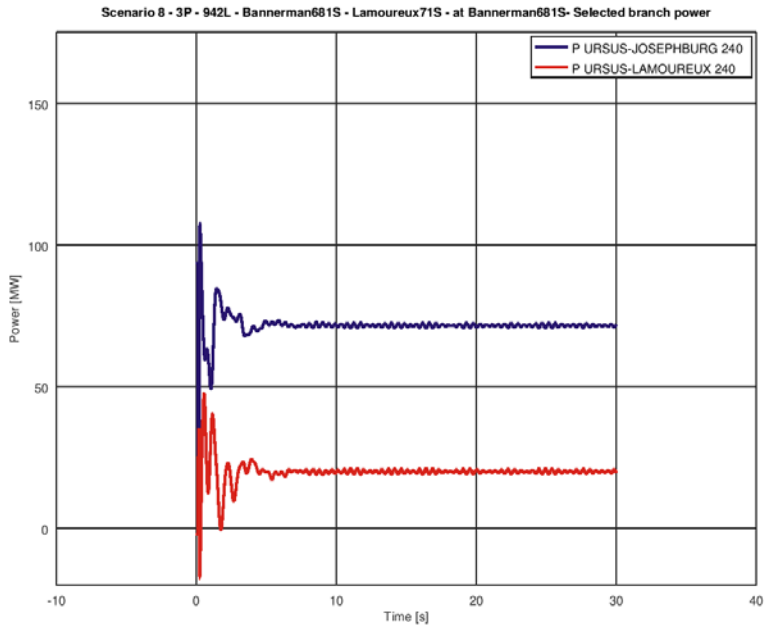


Figure A-1287 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

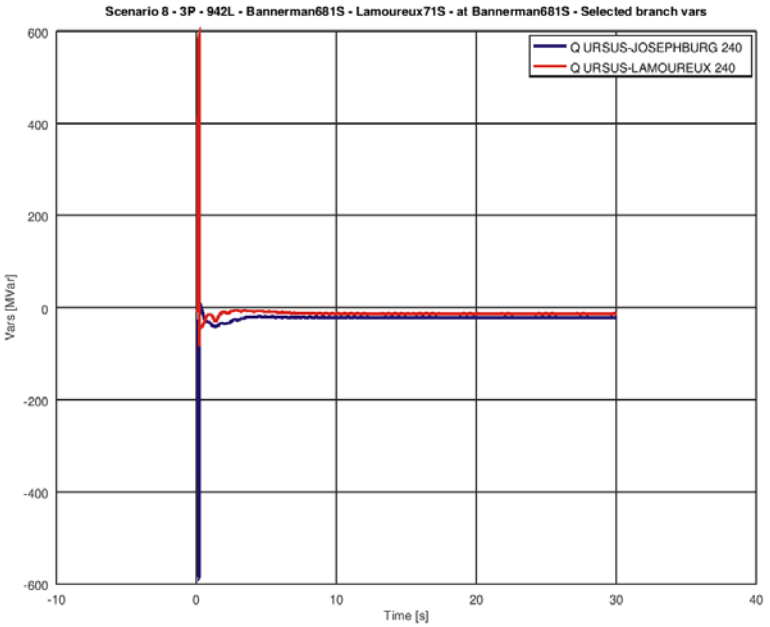


Figure A-1288 Scenario 8 - 3P - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

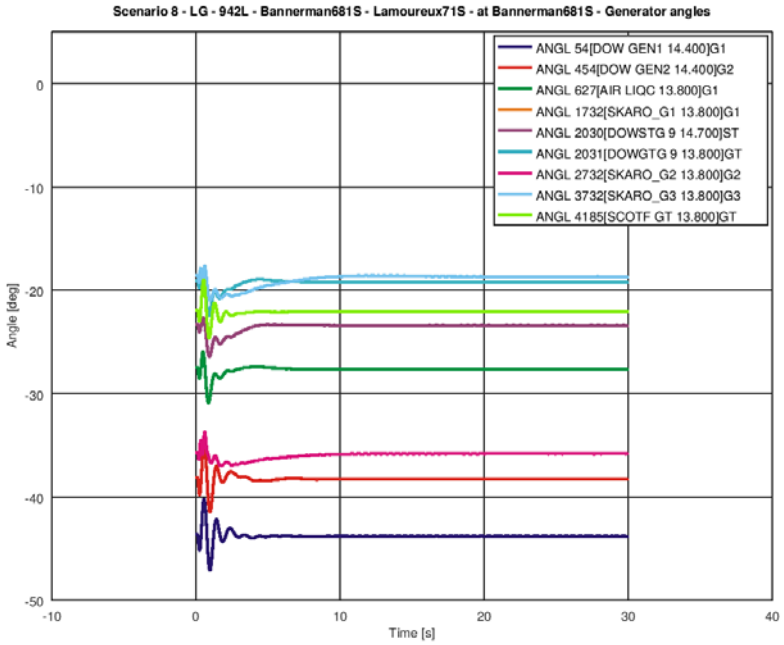


Figure A-1289 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

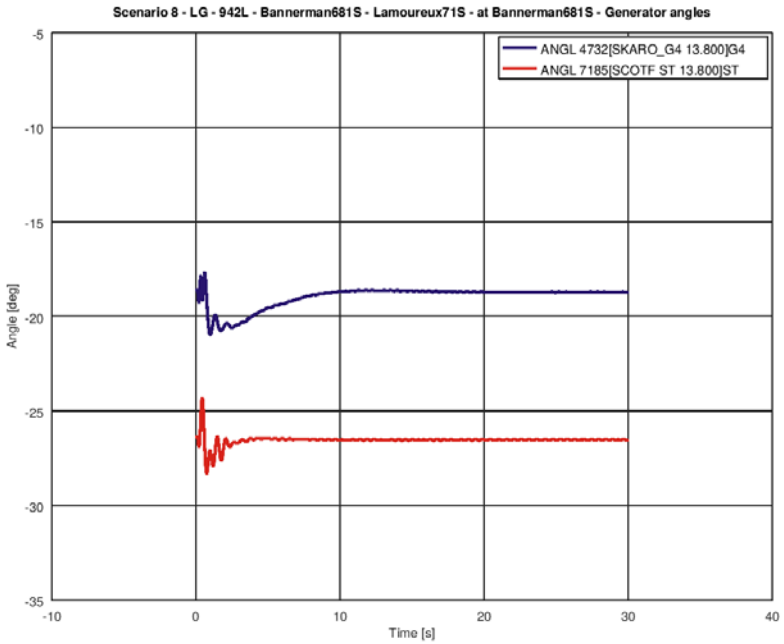


Figure A-1290 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator angles

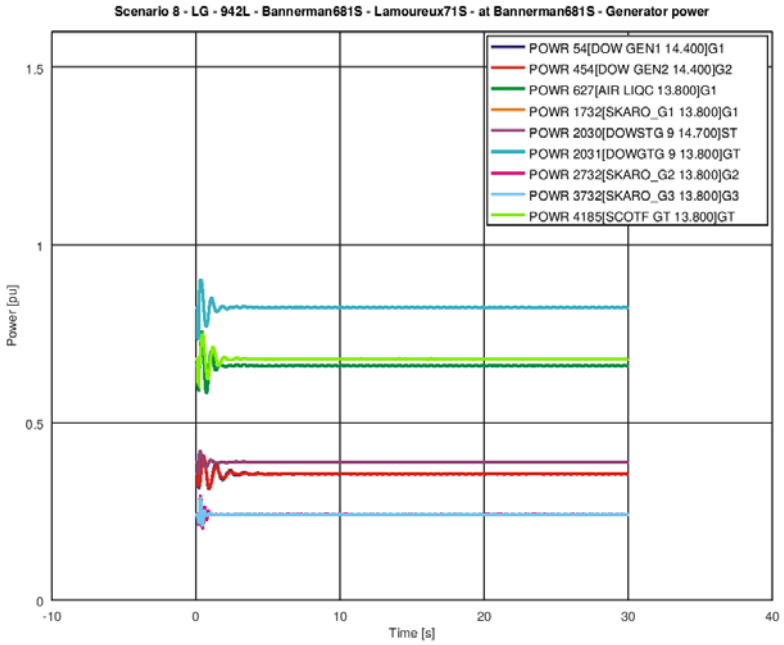


Figure A-1291 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

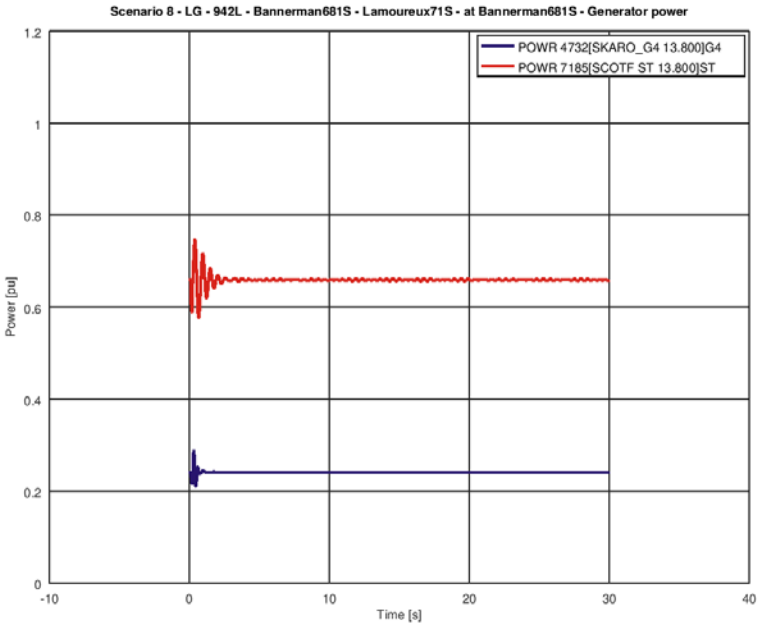


Figure A-1292 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator power

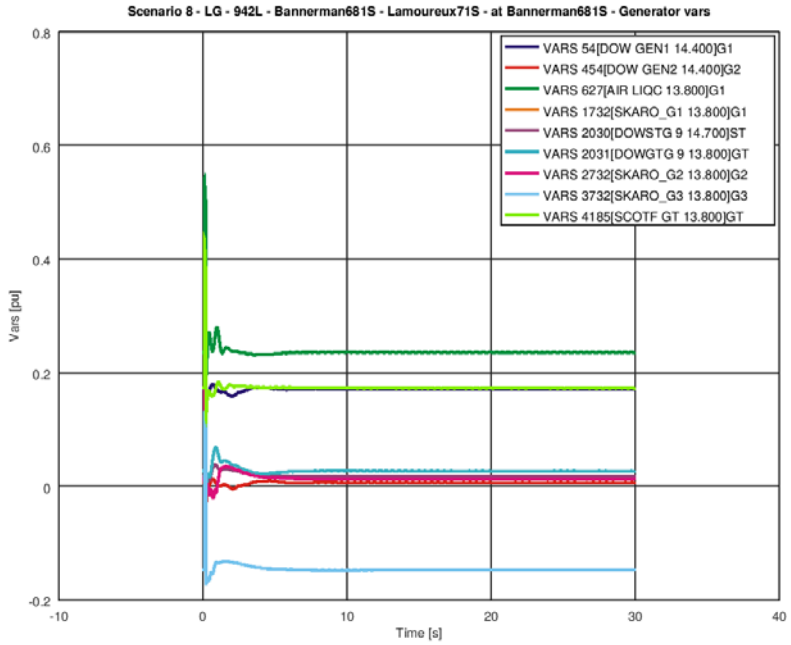


Figure A-1293 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

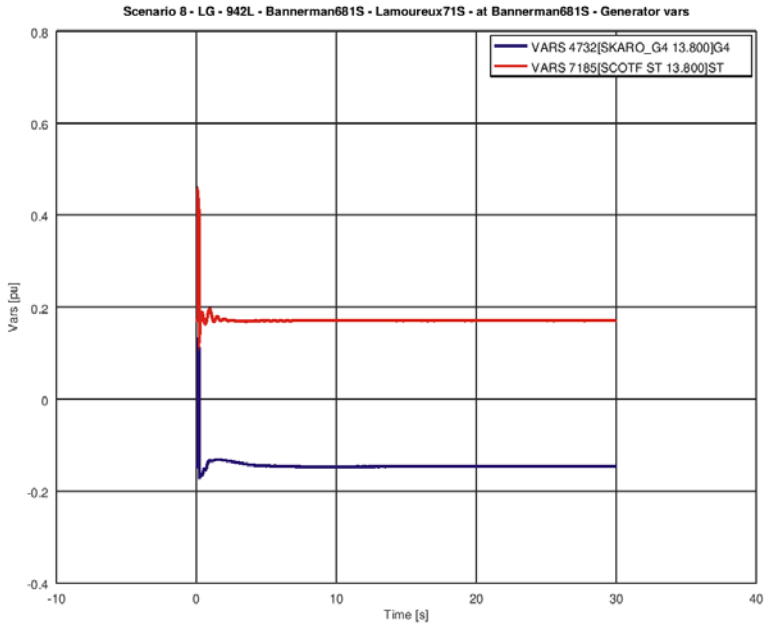


Figure A-1294 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Generator vars

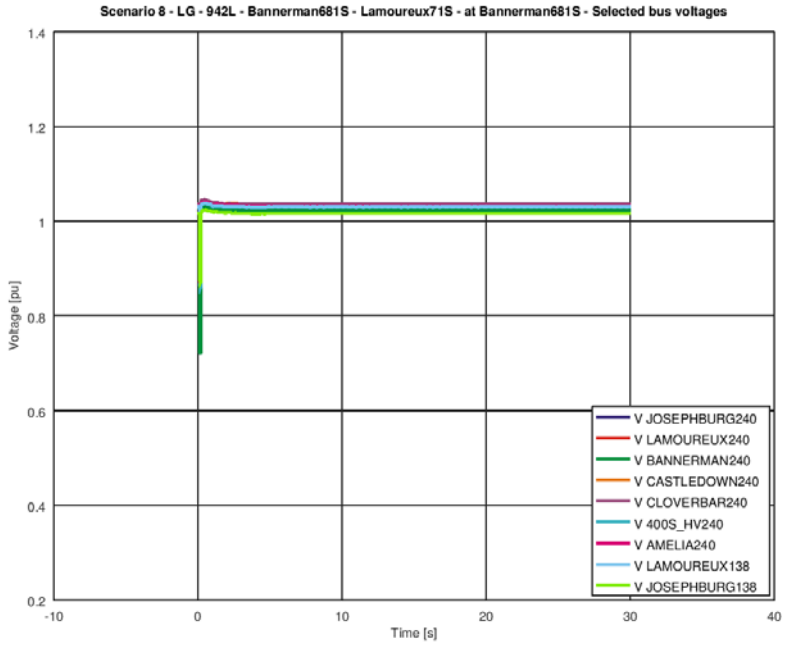


Figure A-1295 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

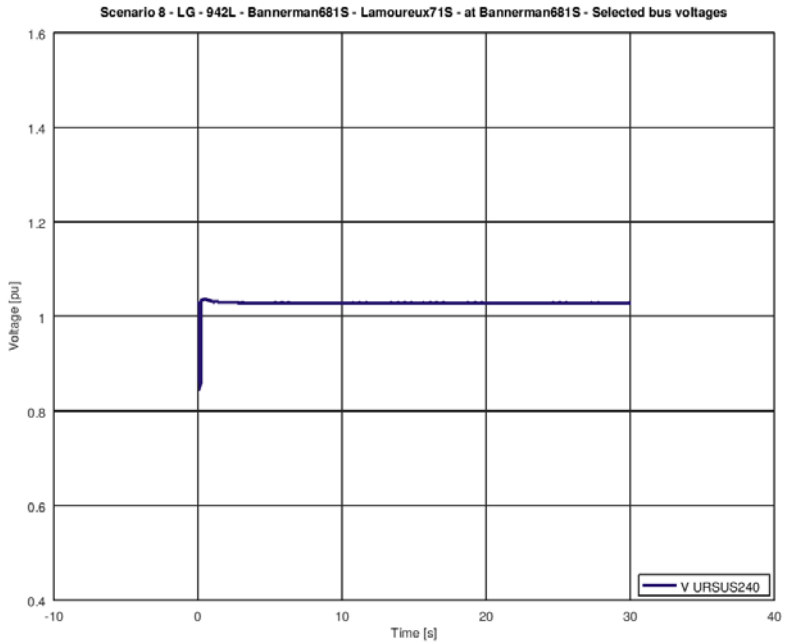


Figure A-1296 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected bus voltages

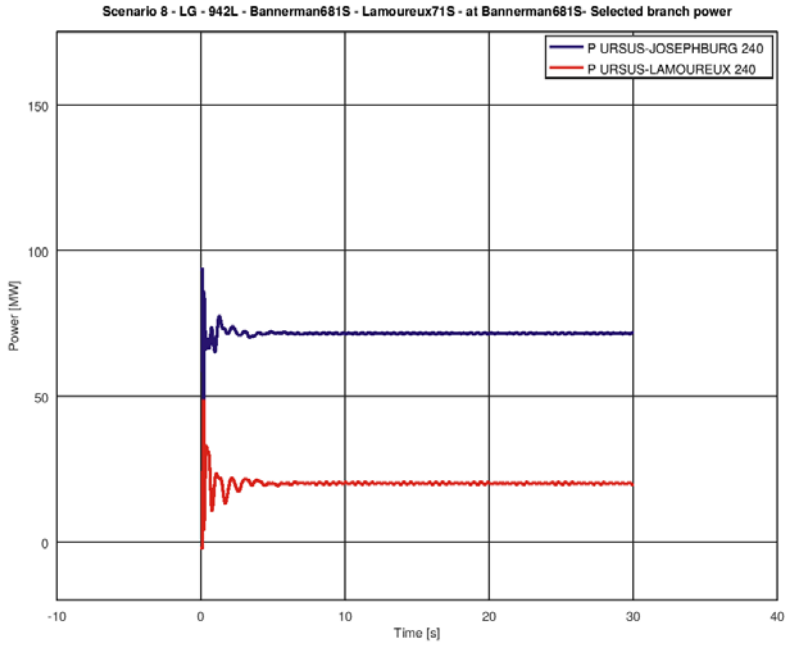


Figure A-1297 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch power

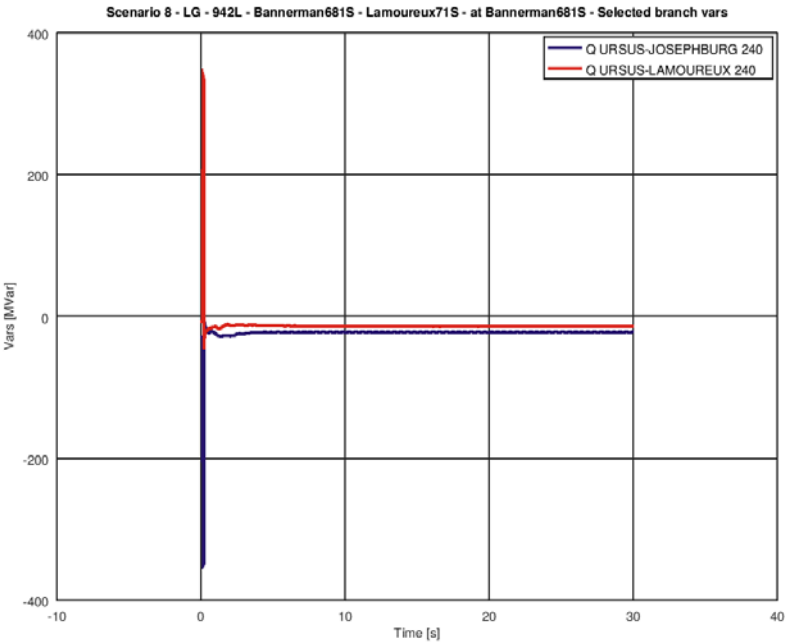


Figure A-1298 Scenario 8 - LG - 942L - Bannerman681S - Lamoureux71S - at Bannerman681S - Selected branch vars

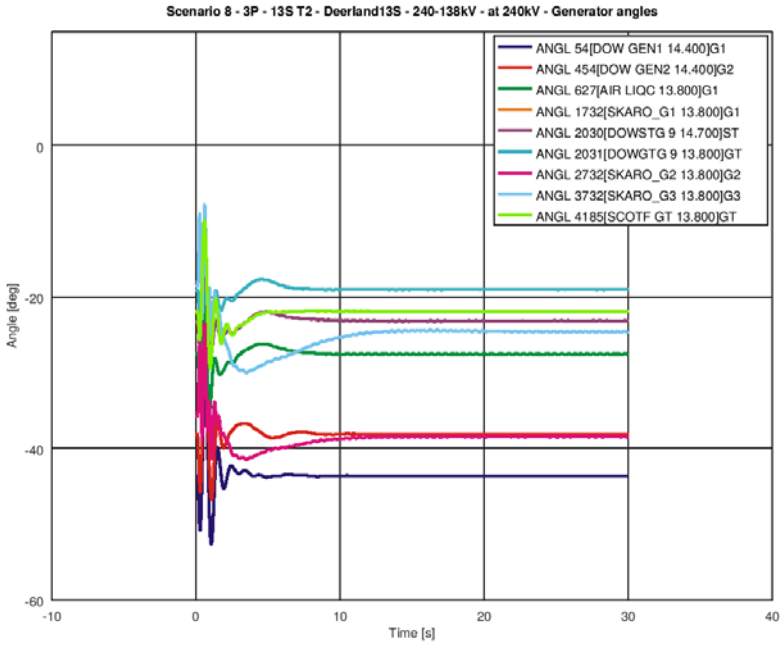


Figure A-1299 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

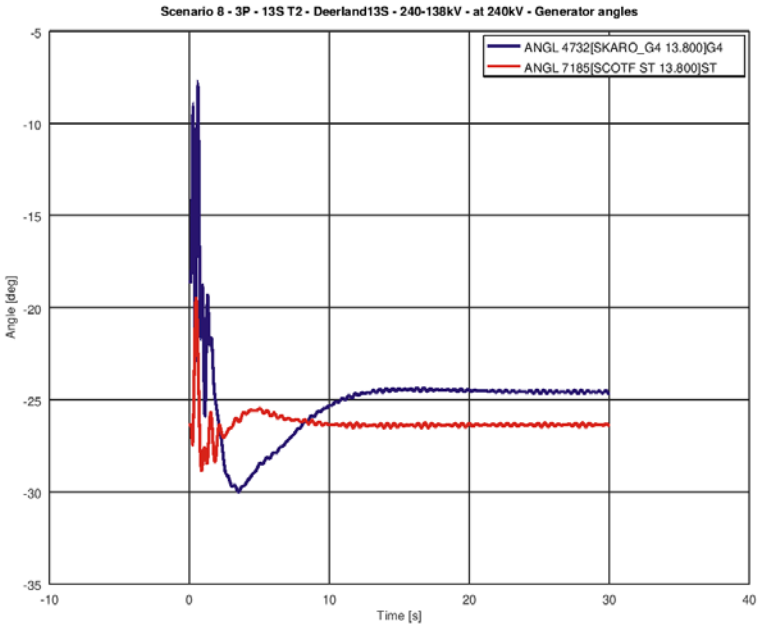


Figure A-1300 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

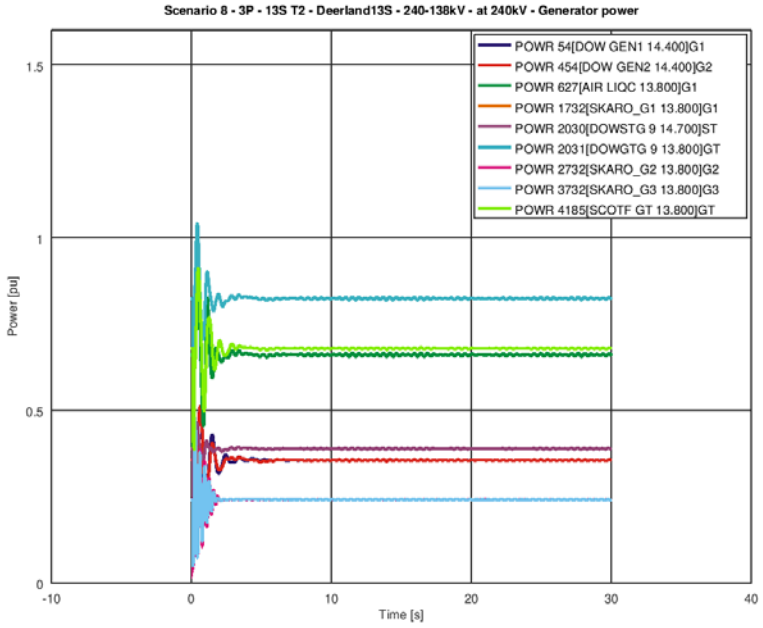


Figure A-1301 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

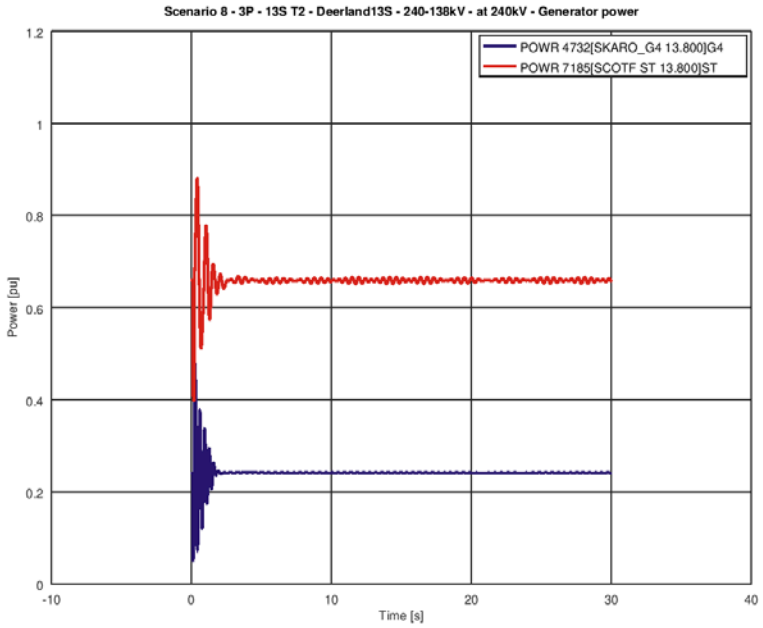


Figure A-1302 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

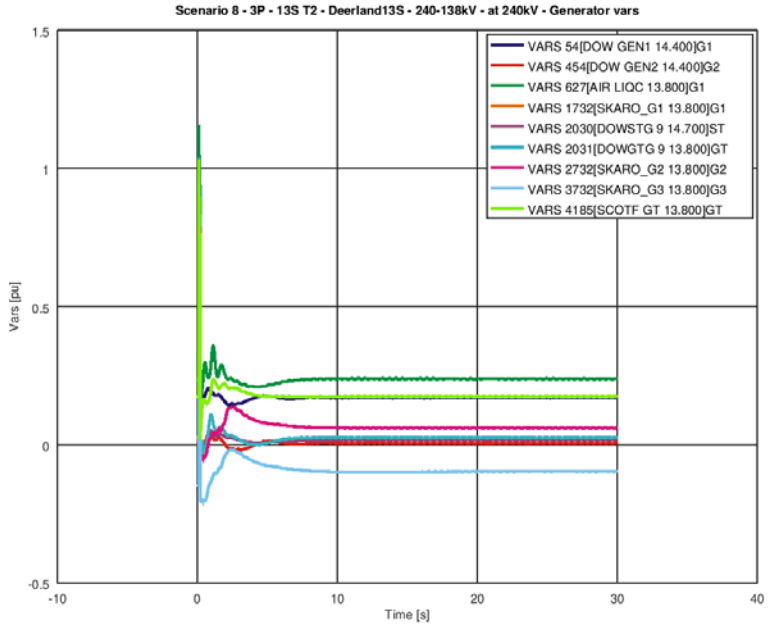


Figure A-1303 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

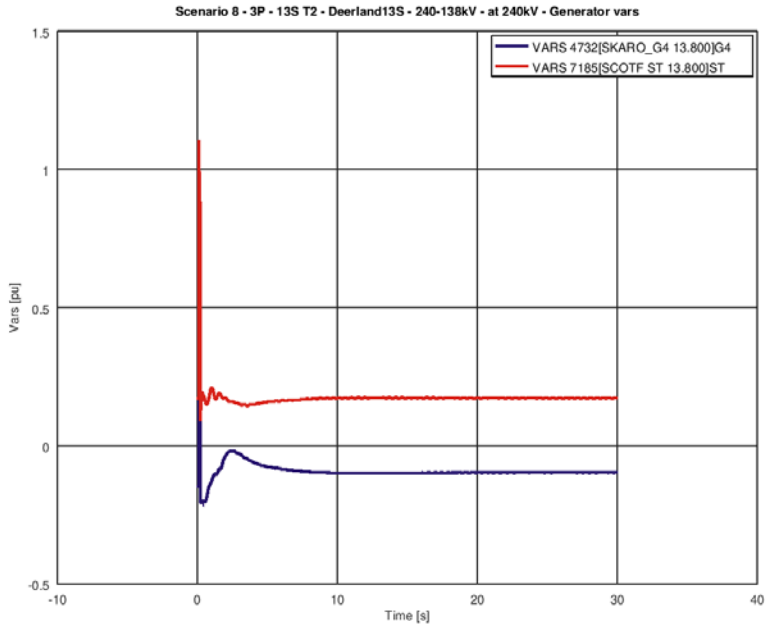


Figure A-1304 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

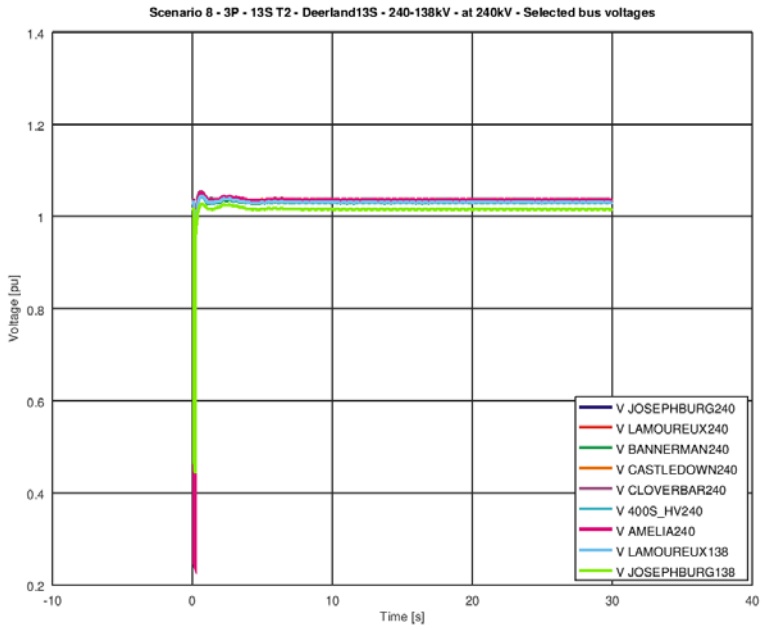


Figure A-1305 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

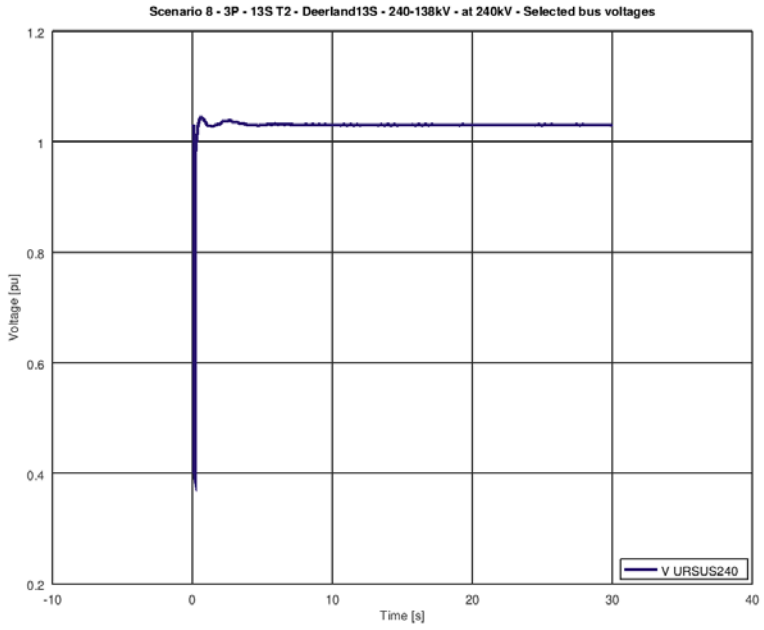


Figure A-1306 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

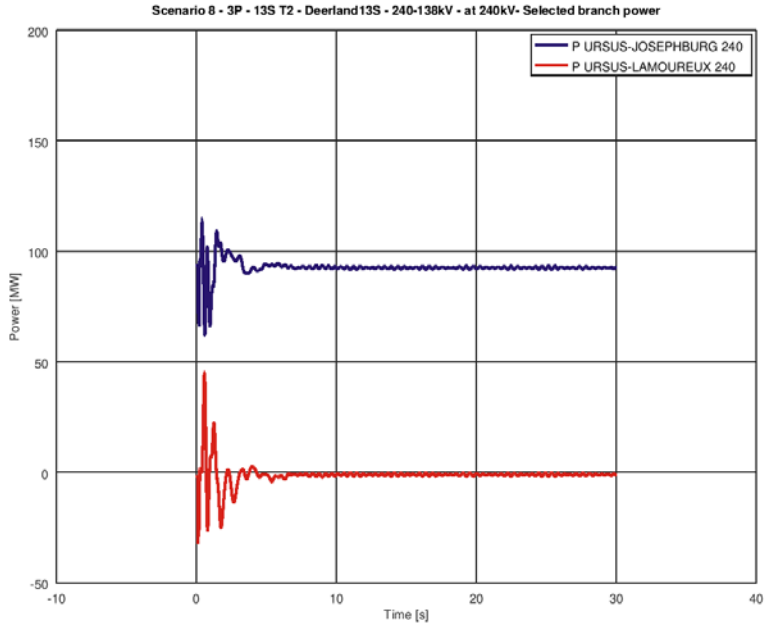


Figure A-1307 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch power

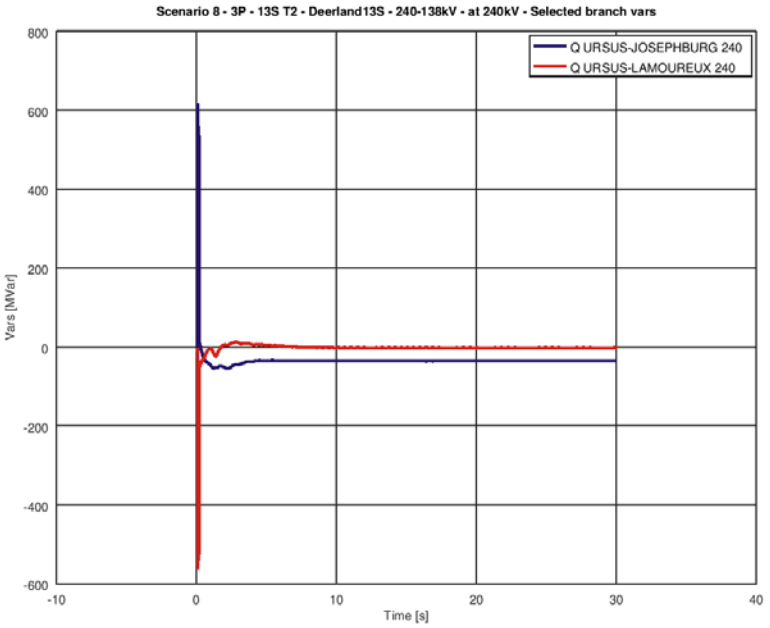


Figure A-1308 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch vars

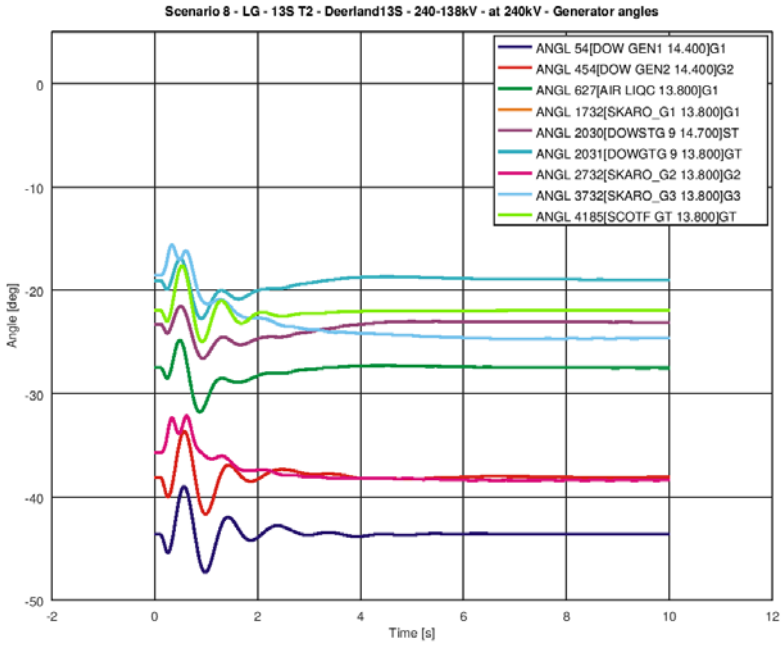


Figure A-1309 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

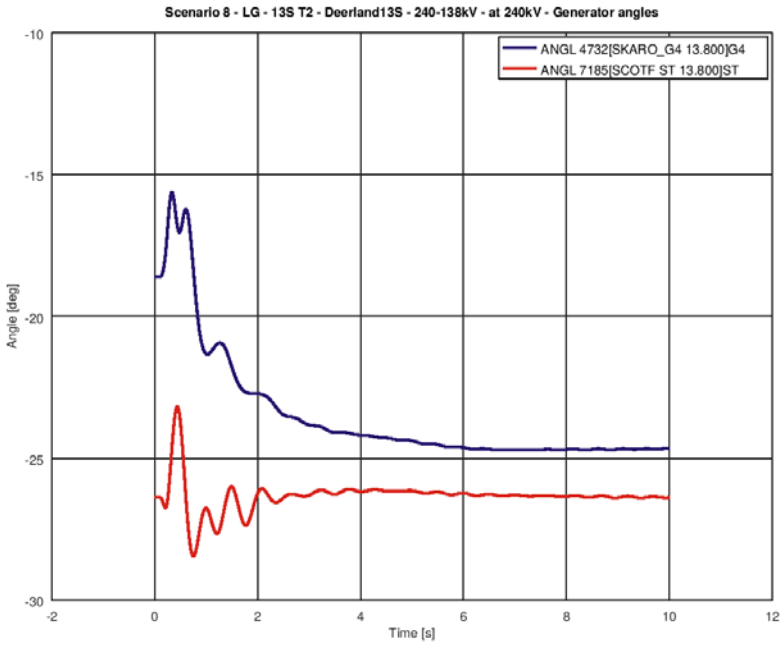


Figure A-1310 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator angles

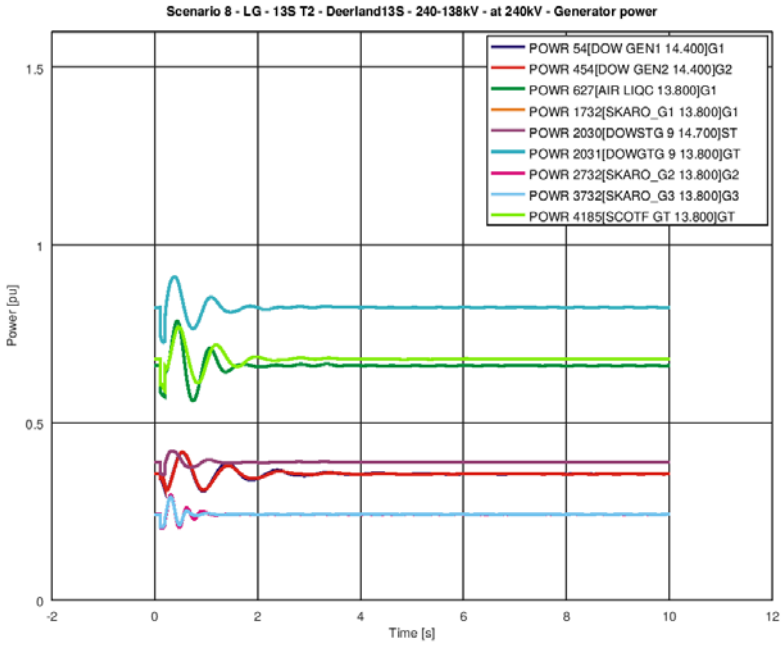


Figure A-1311 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

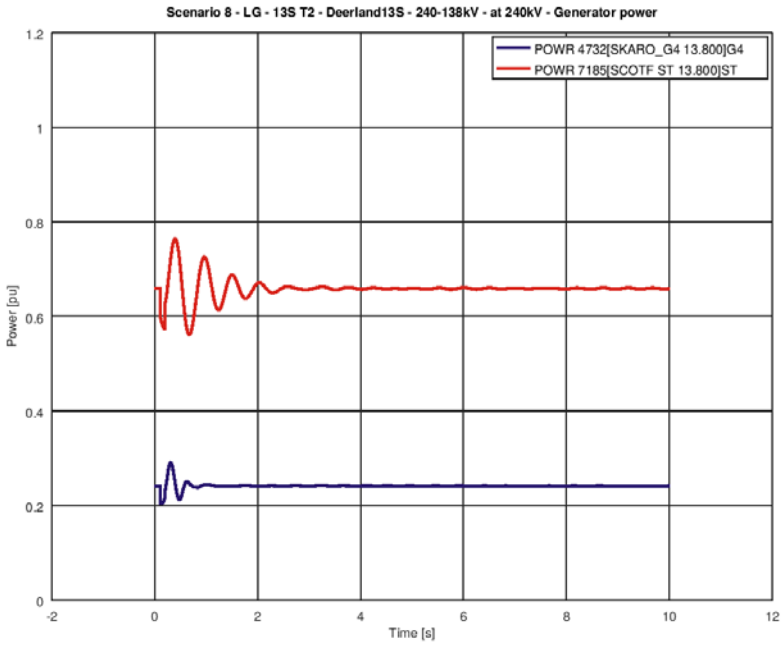


Figure A-1312 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator power

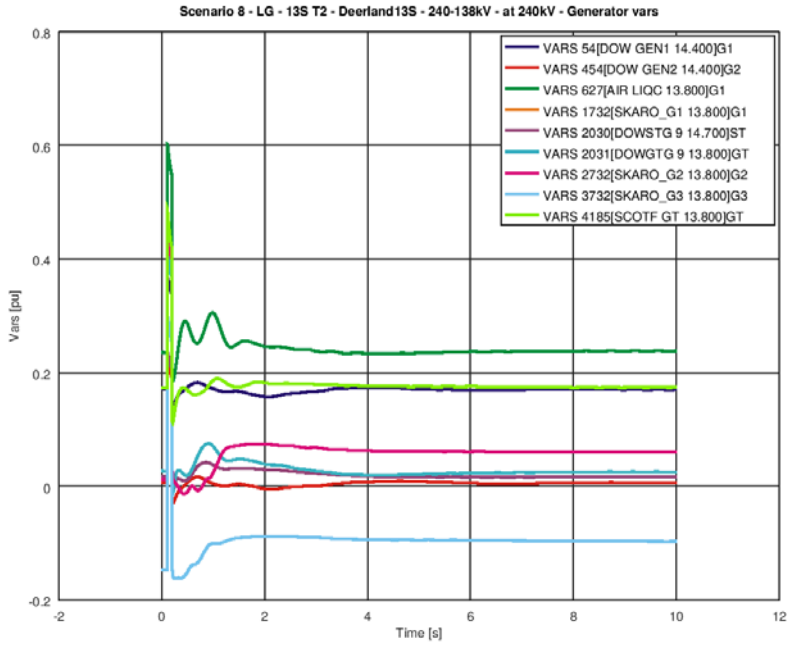


Figure A-1313 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

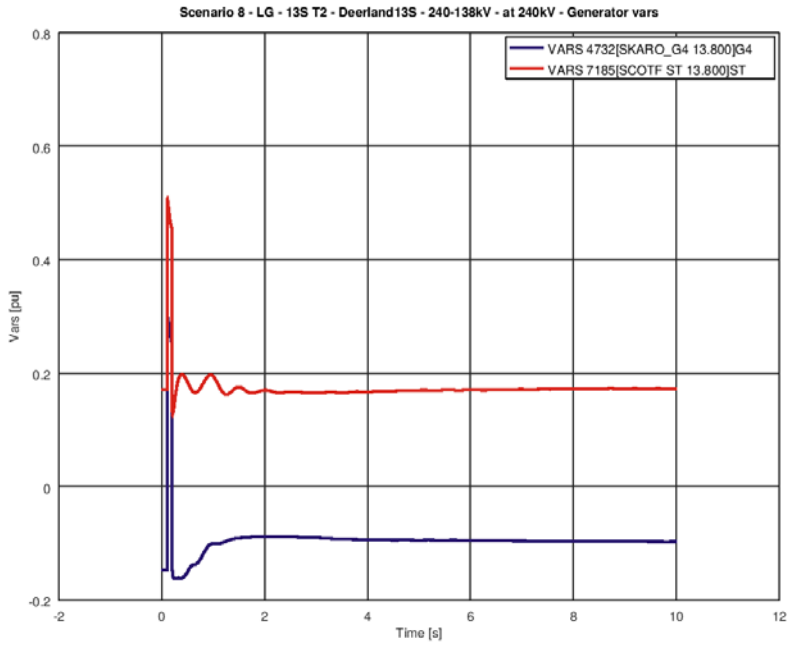


Figure A-1314 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Generator vars

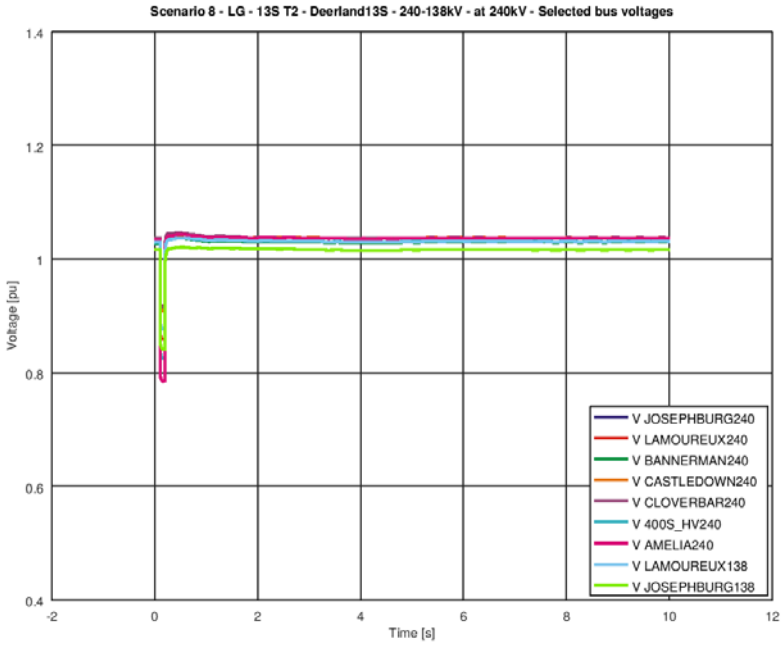


Figure A-1315 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

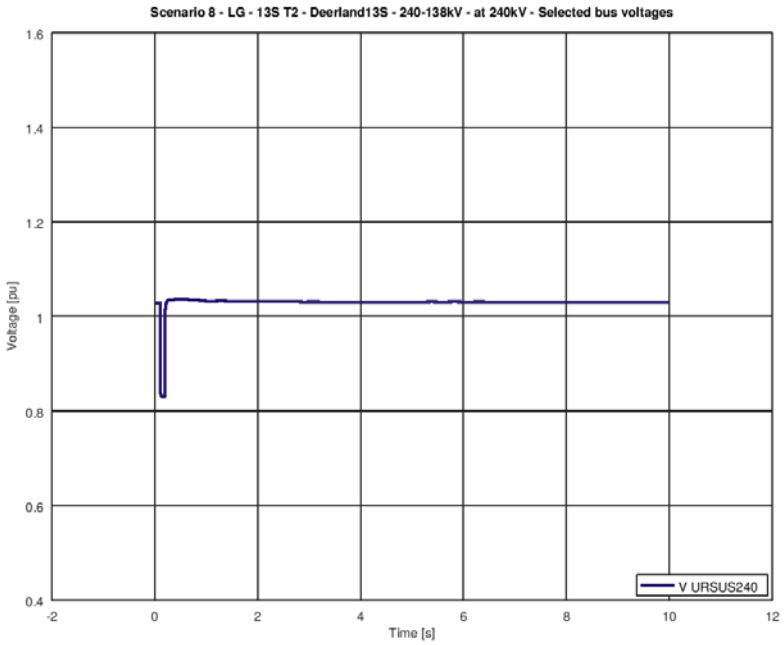


Figure A-1316 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected bus voltages

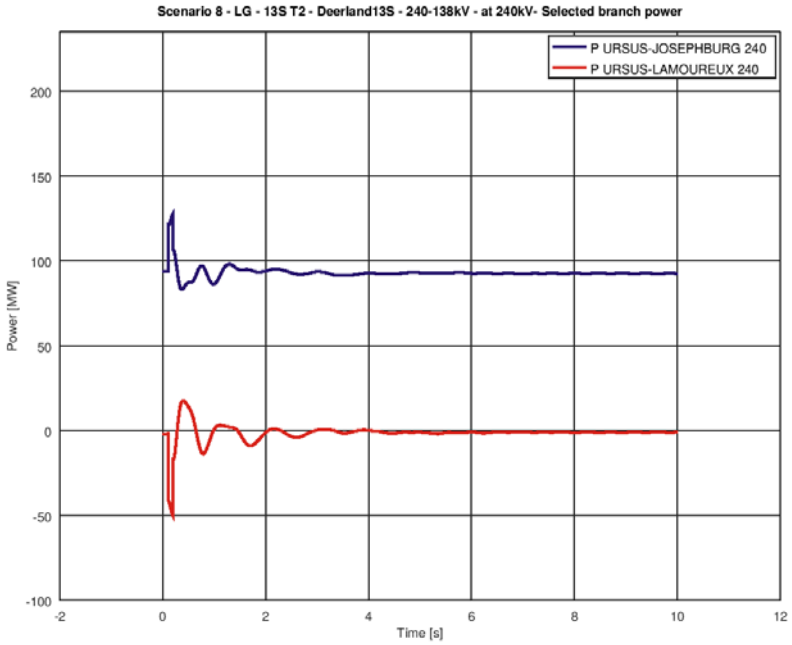


Figure A-1317 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch power

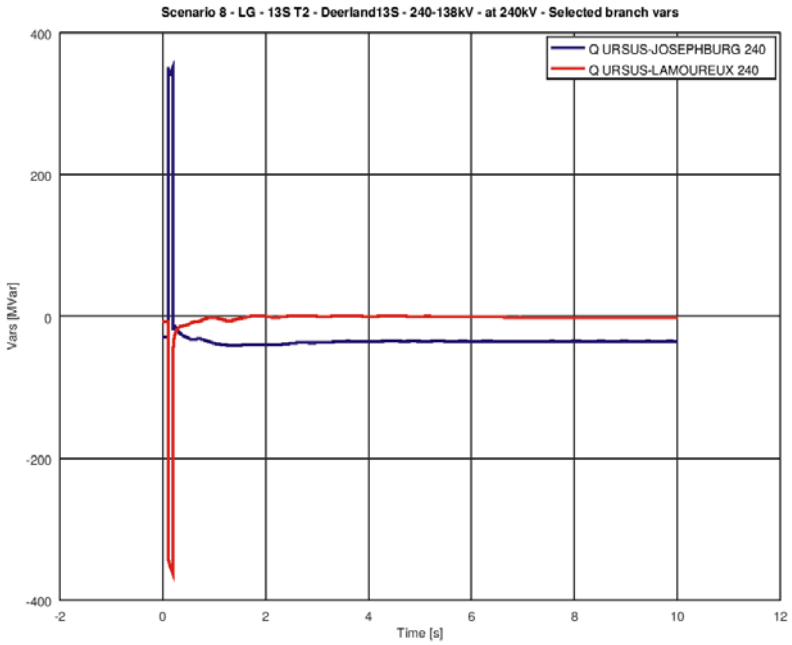


Figure A-1318 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 240kV - Selected branch vars

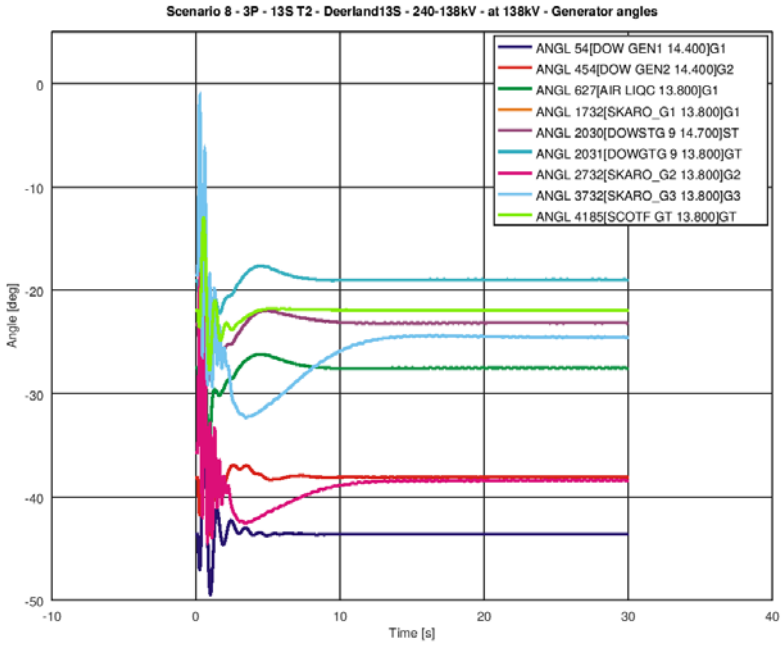


Figure A-1319 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

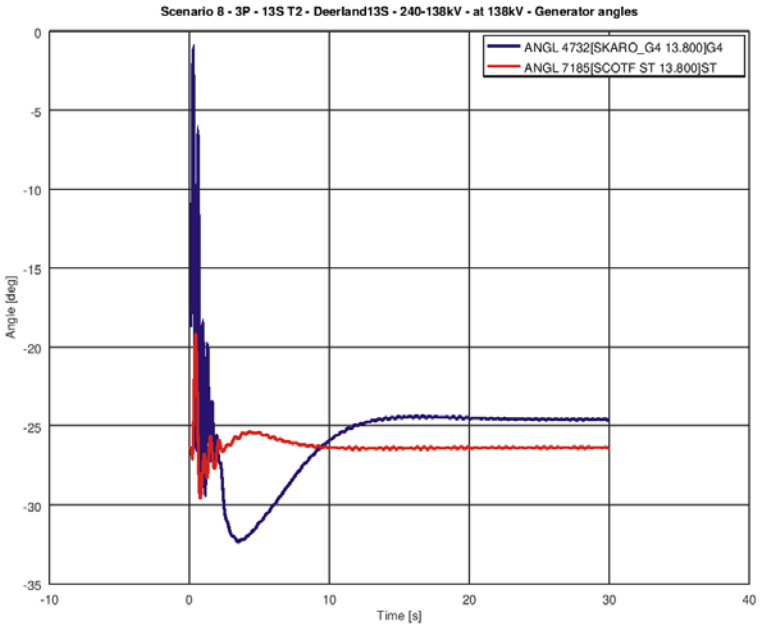


Figure A-1320 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

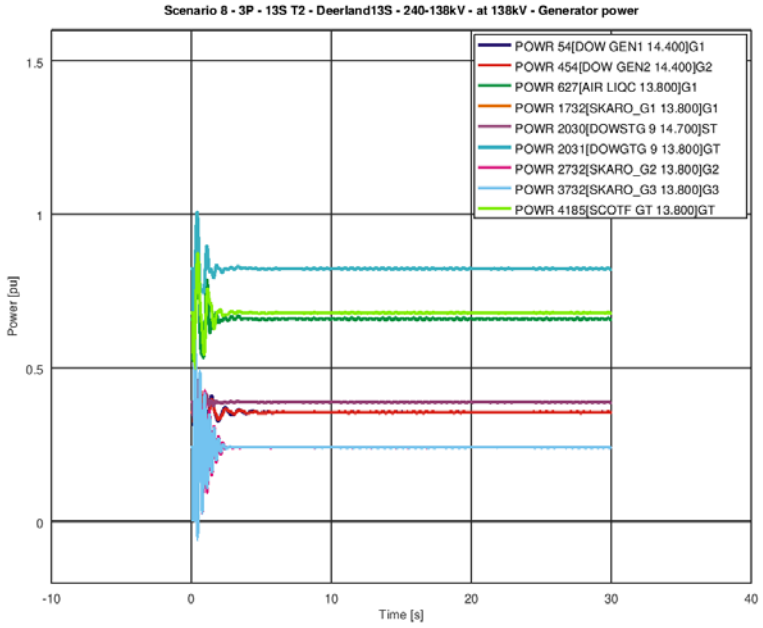


Figure A-1321 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

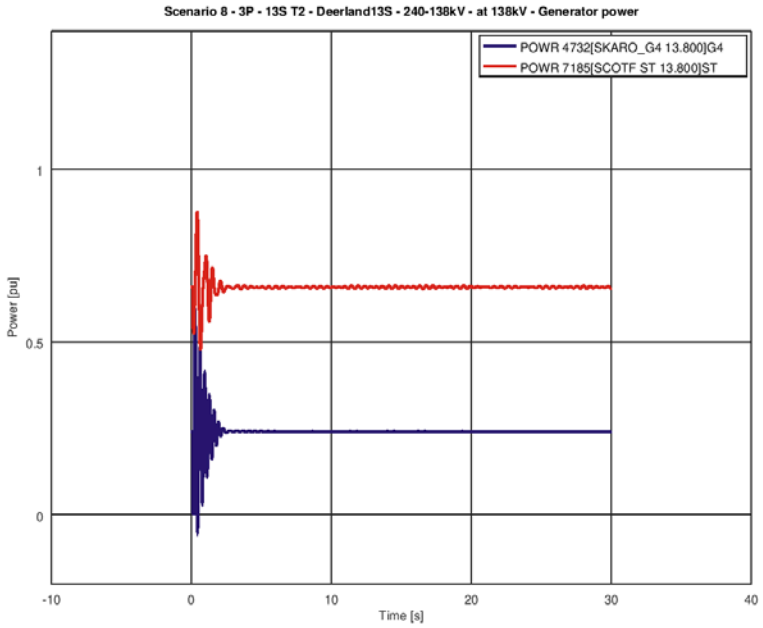


Figure A-1322 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

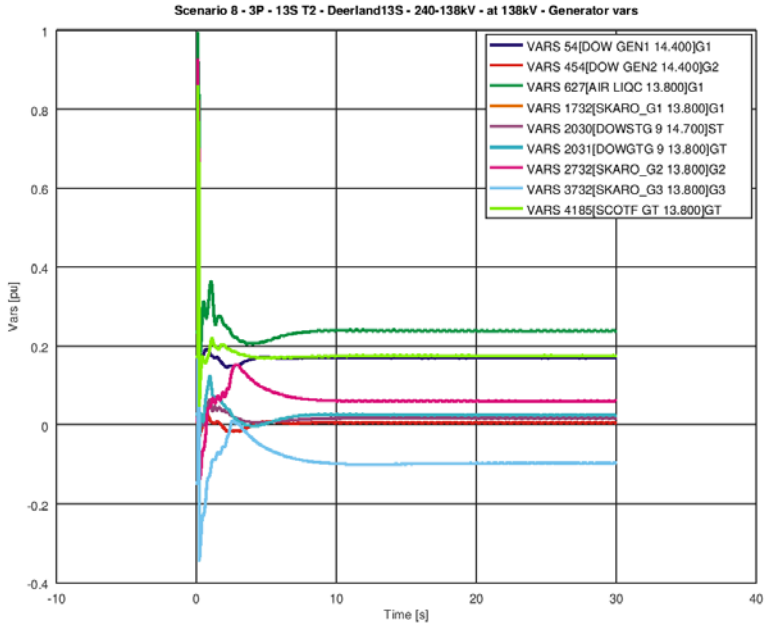


Figure A-1323 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

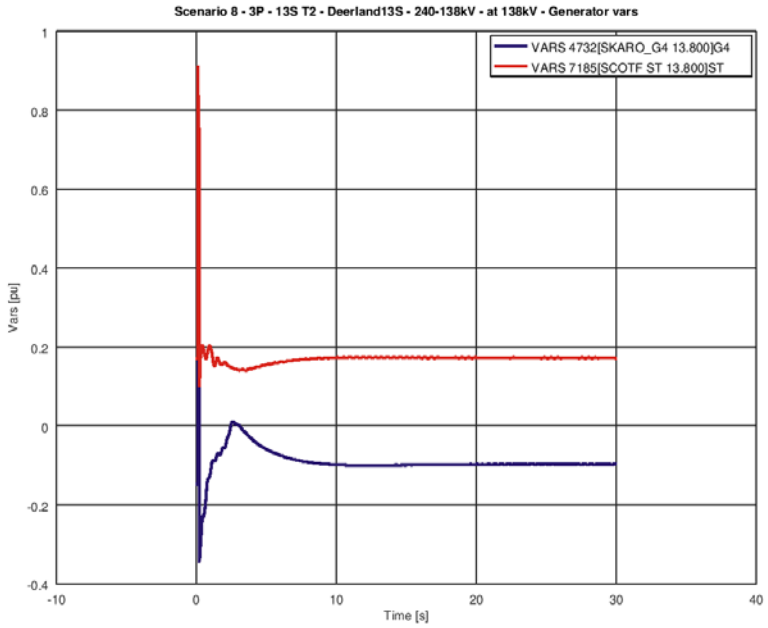


Figure A-1324 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

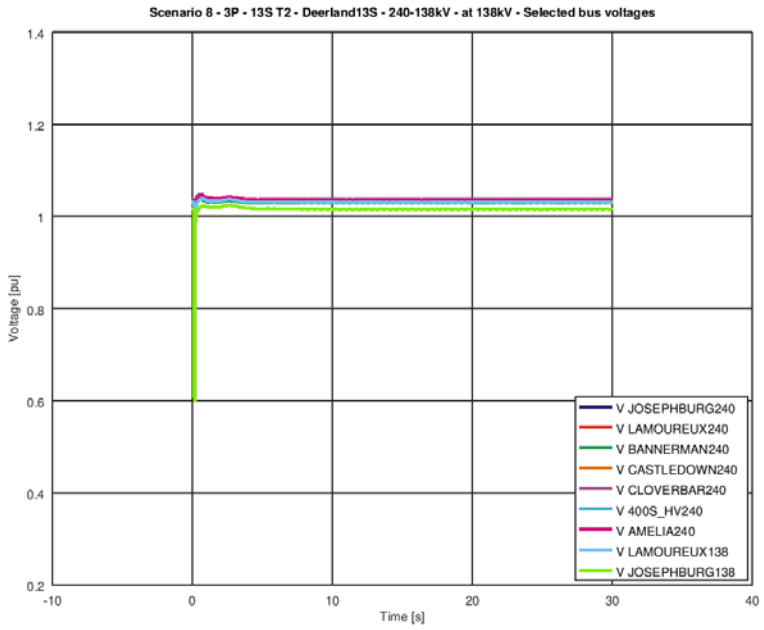


Figure A-1325 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

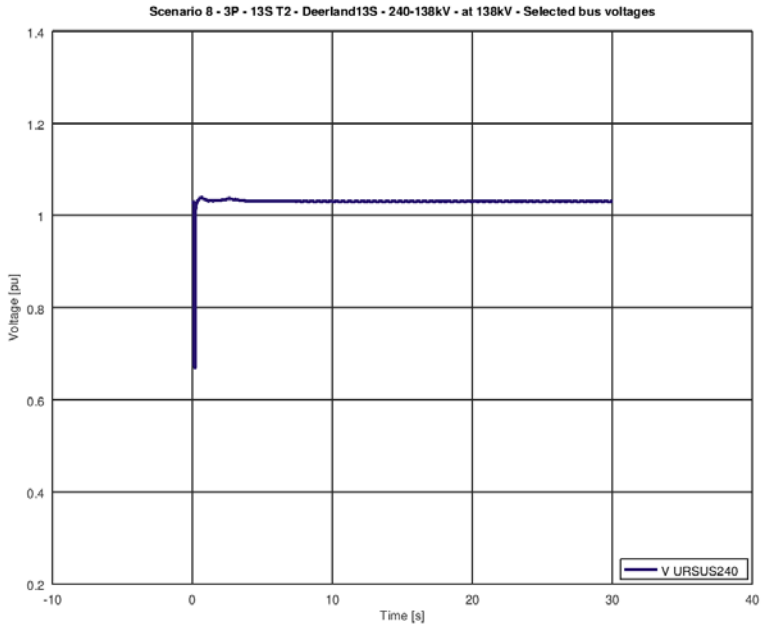


Figure A-1326 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

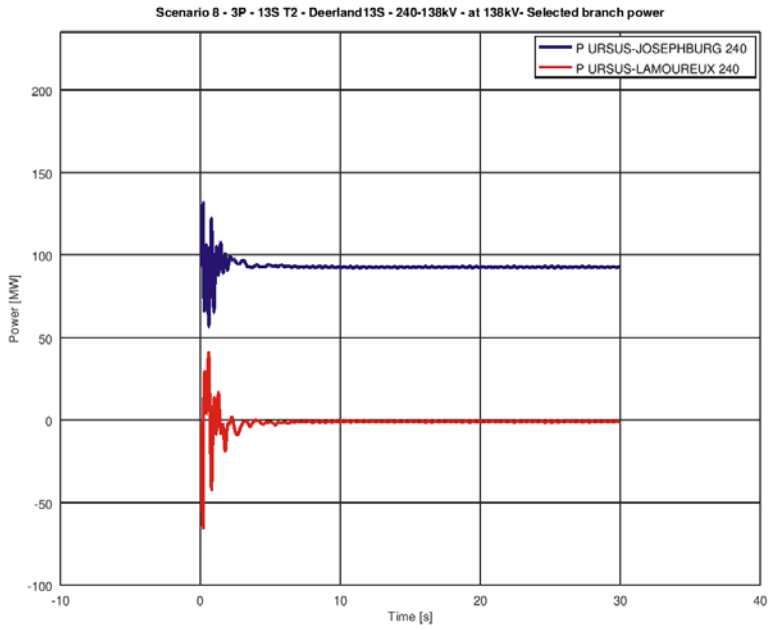


Figure A-1327 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch power

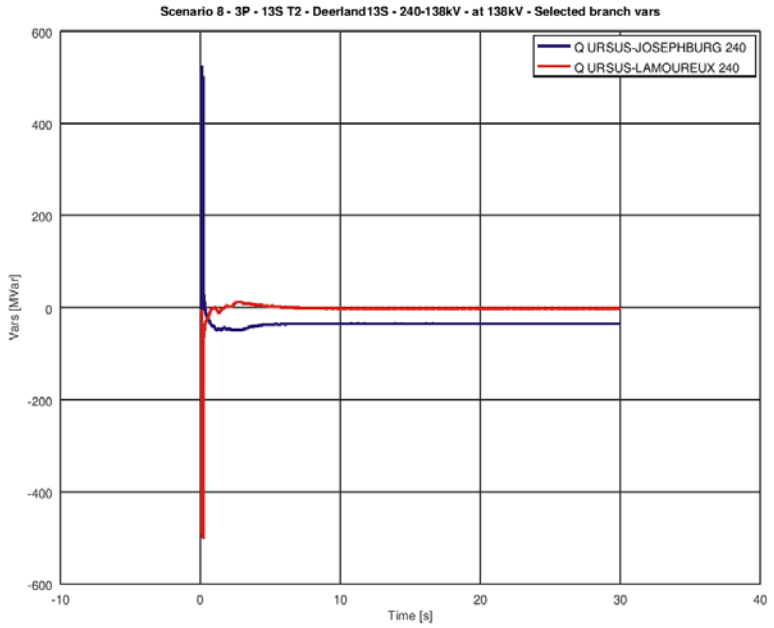


Figure A-1328 Scenario 8 - 3P - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch vars

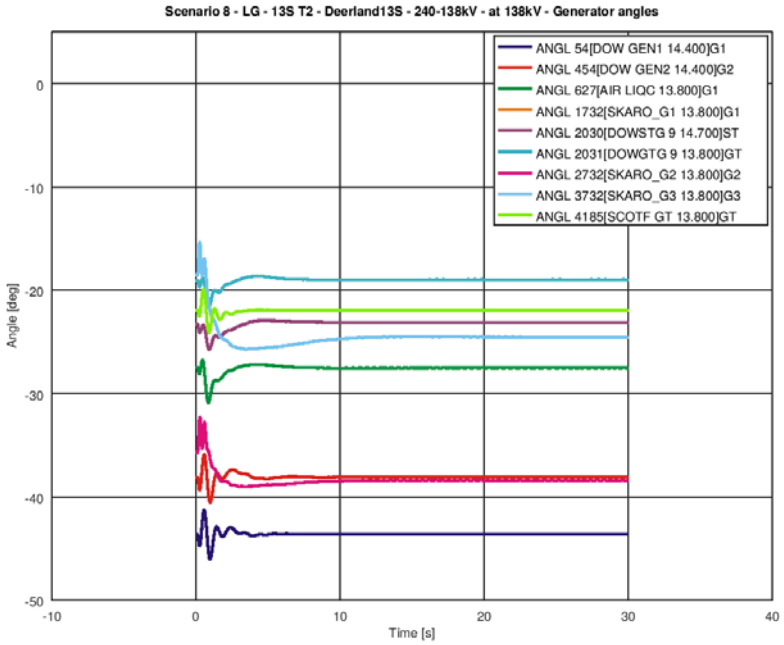


Figure A-1329 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

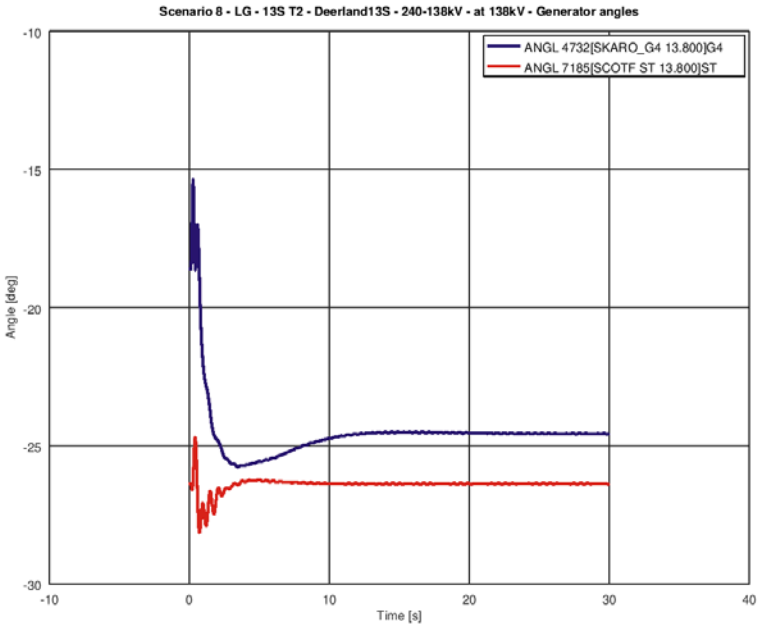


Figure A-1330 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator angles

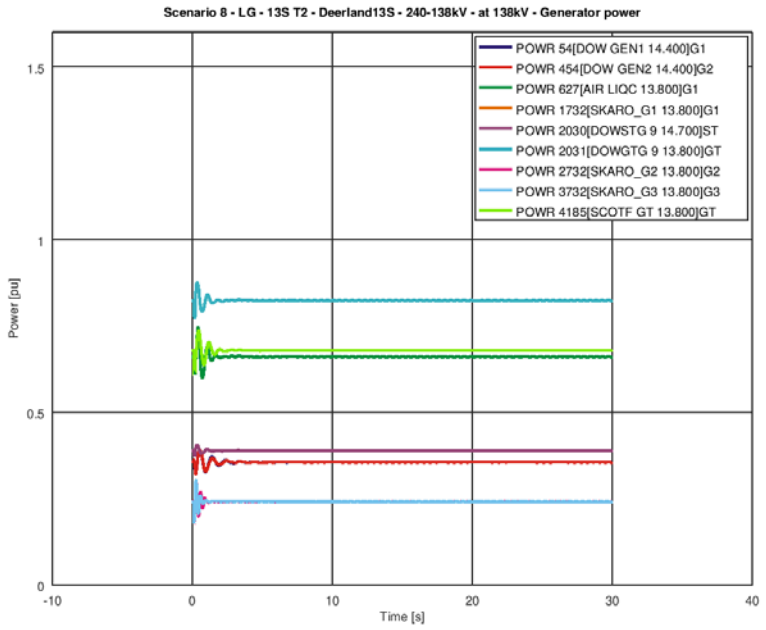


Figure A-1331 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

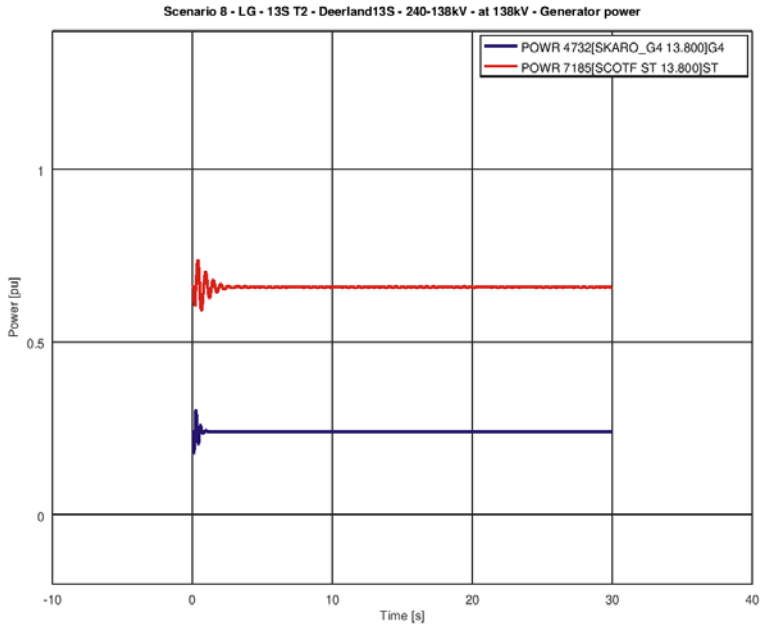


Figure A-1332 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator power

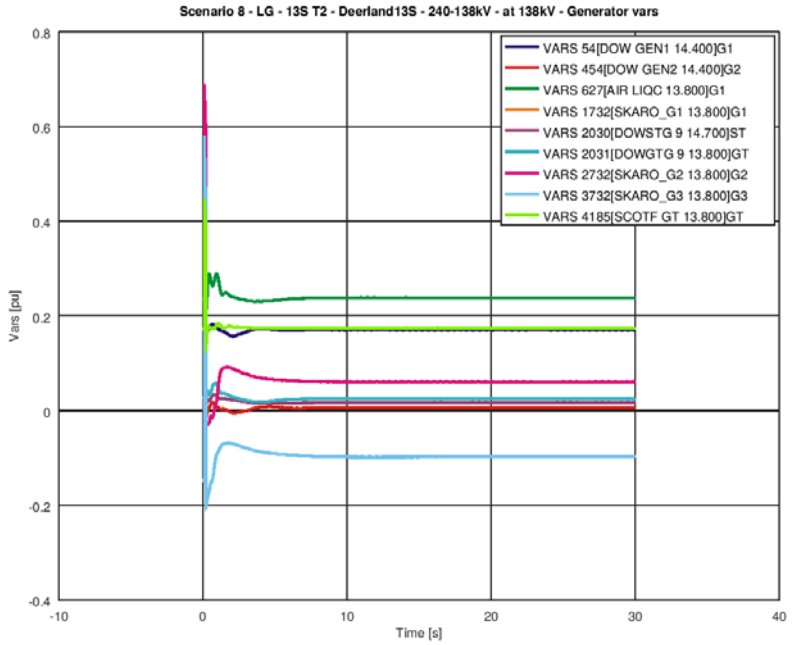


Figure A-1333 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

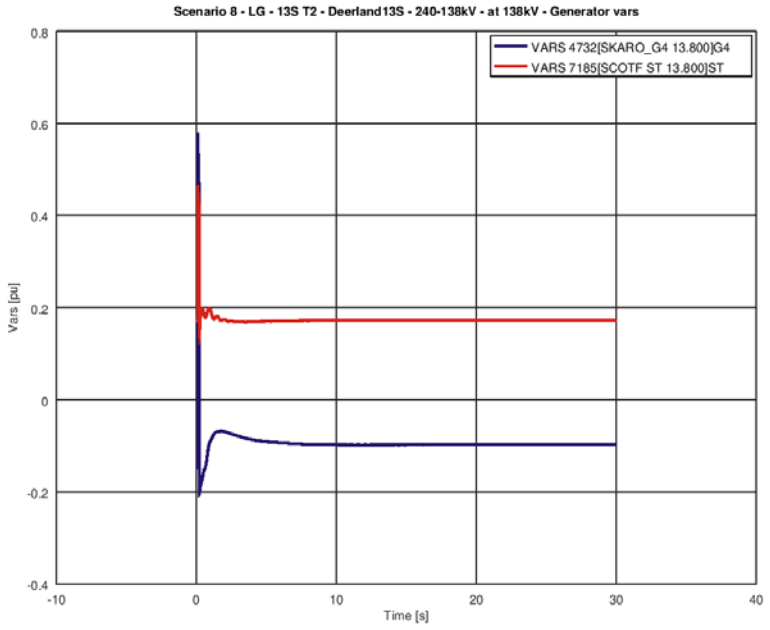


Figure A-1334 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Generator vars

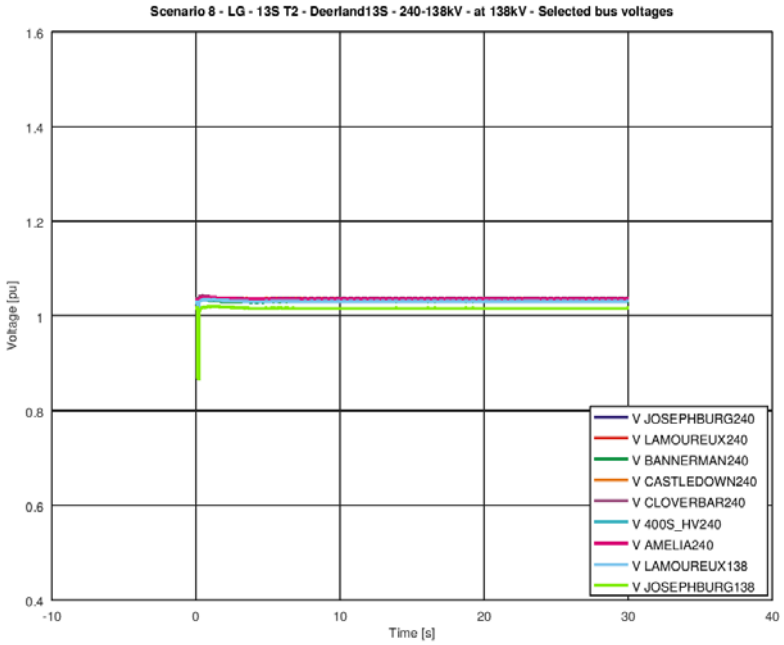


Figure A-1335 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

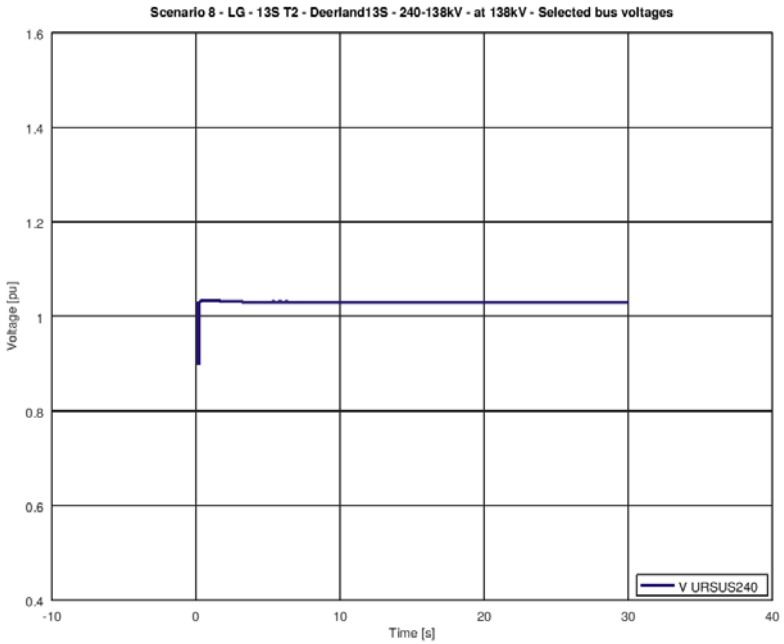


Figure A-1336 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected bus voltages

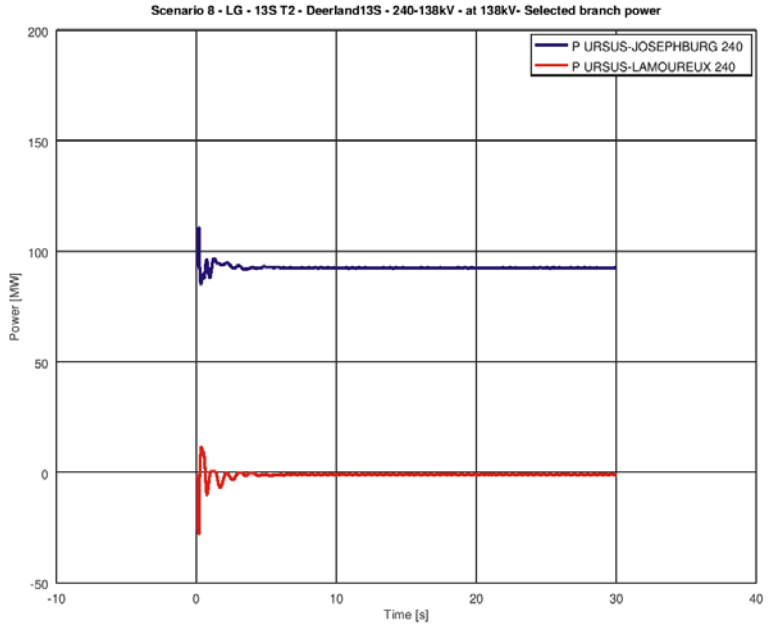


Figure A-1337 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch power

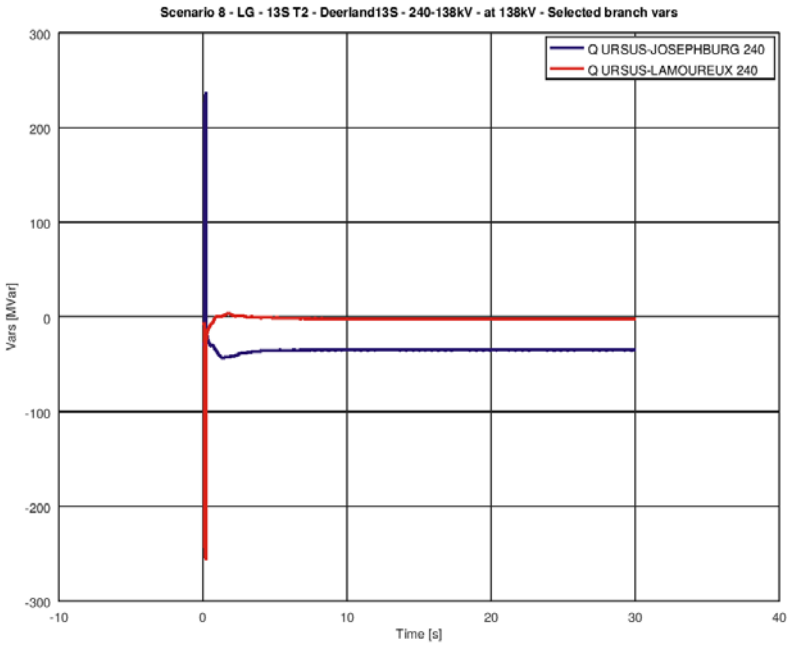


Figure A-1338 Scenario 8 - LG - 13S T2 - Deerland13S - 240-138kV - at 138kV - Selected branch vars

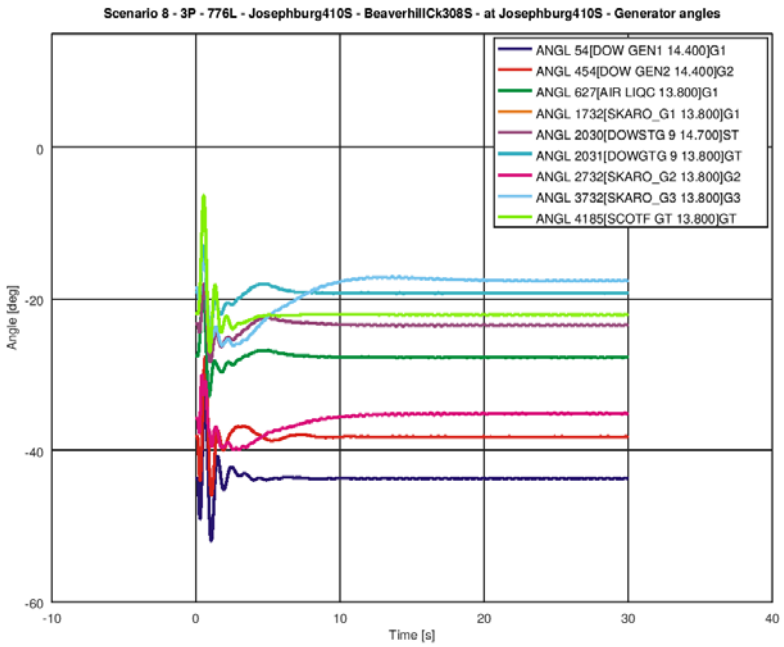


Figure A-1339 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

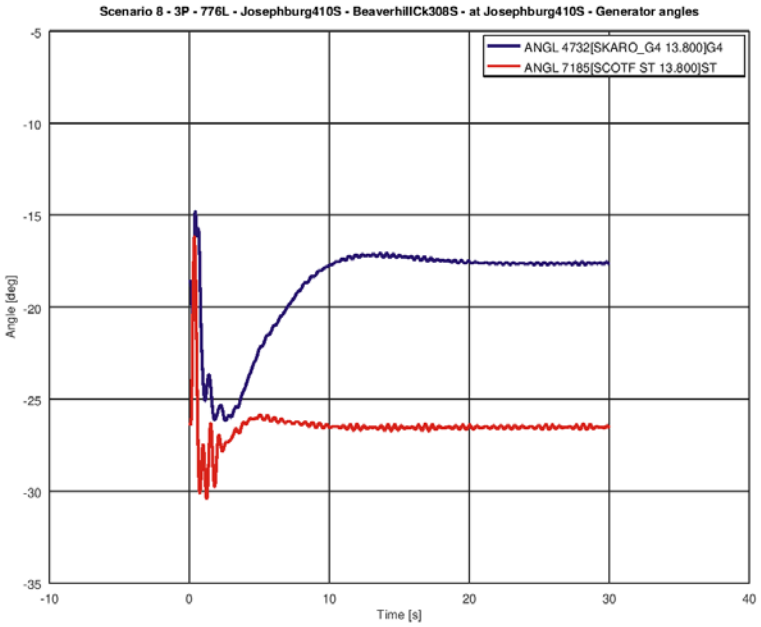


Figure A-1340 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

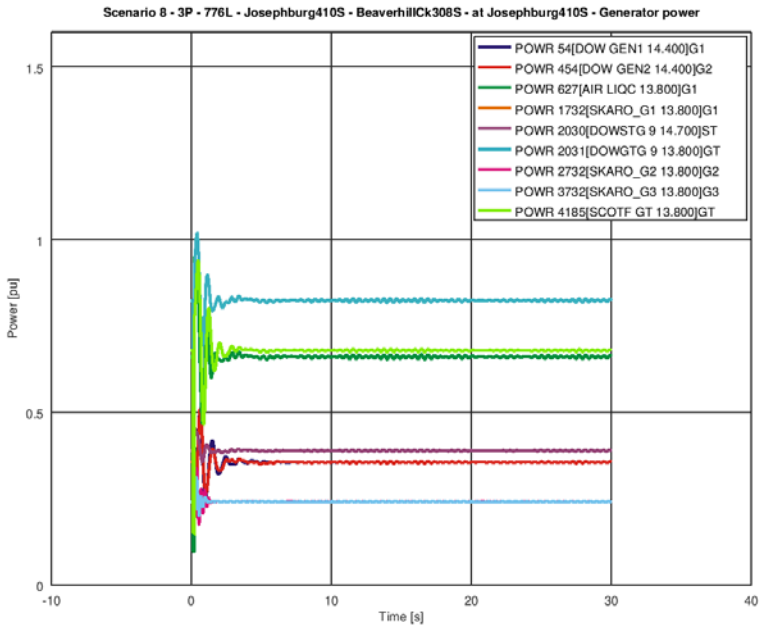


Figure A-1341 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

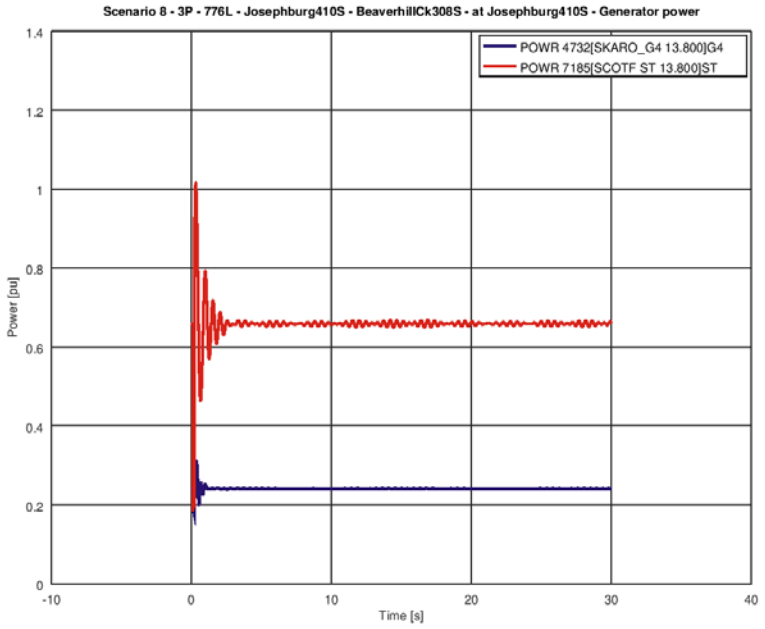


Figure A-1342 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

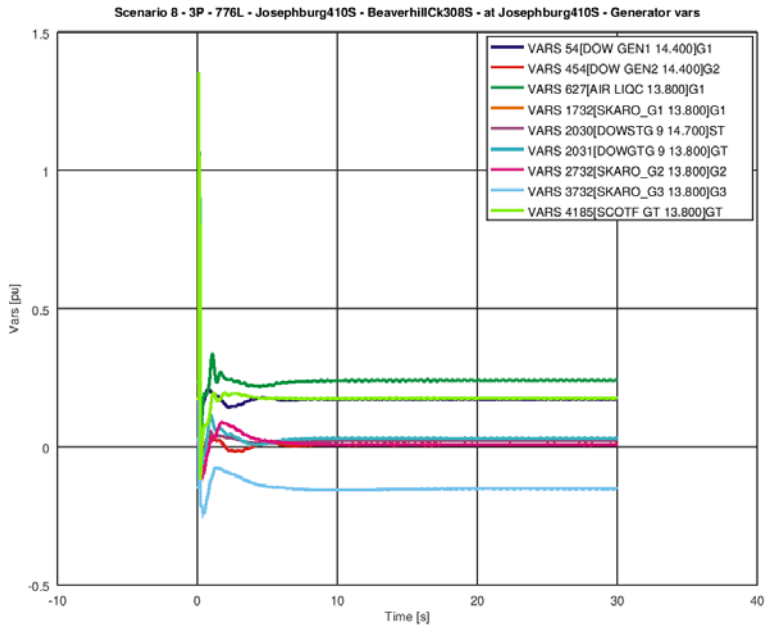


Figure A-1343 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

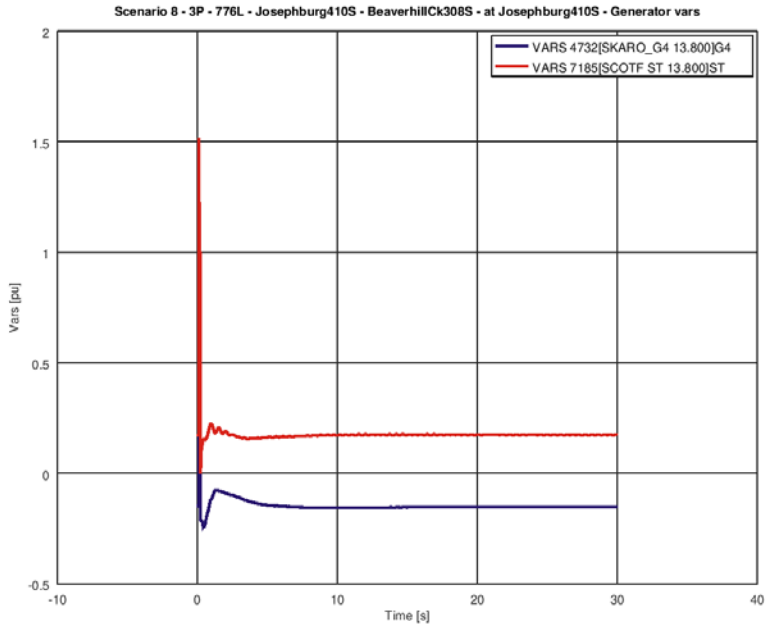


Figure A-1344 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

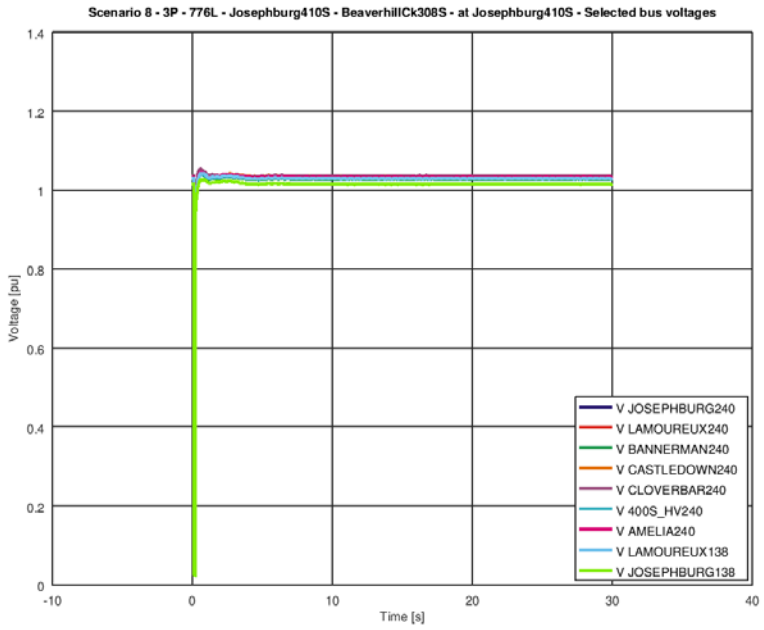


Figure A-1345 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

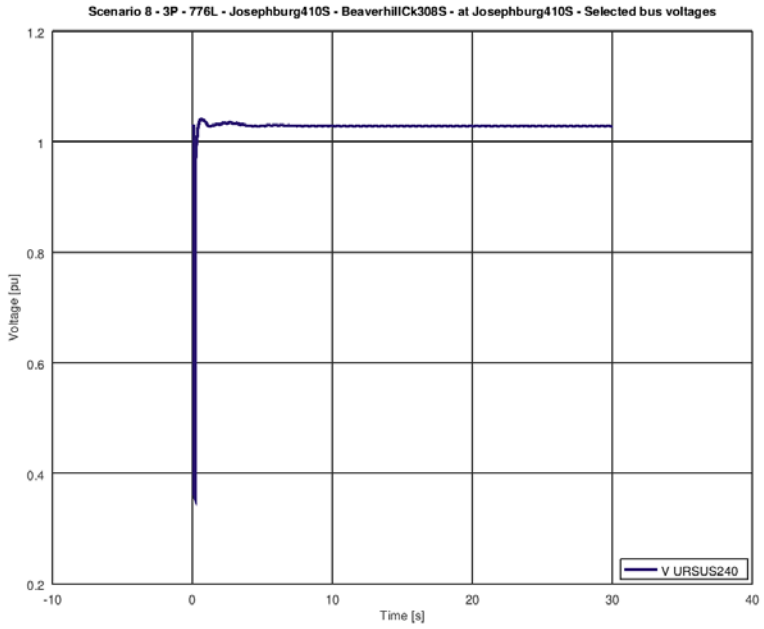


Figure A-1346 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

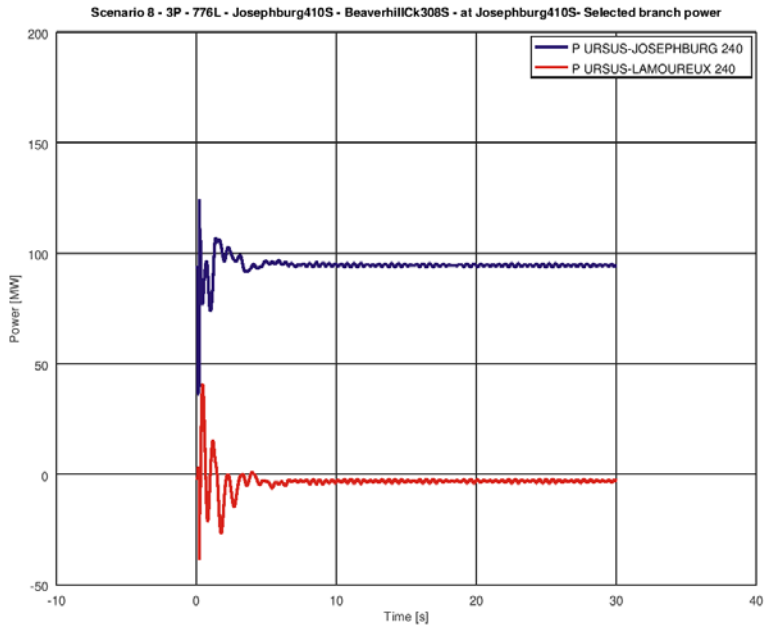


Figure A-1347 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

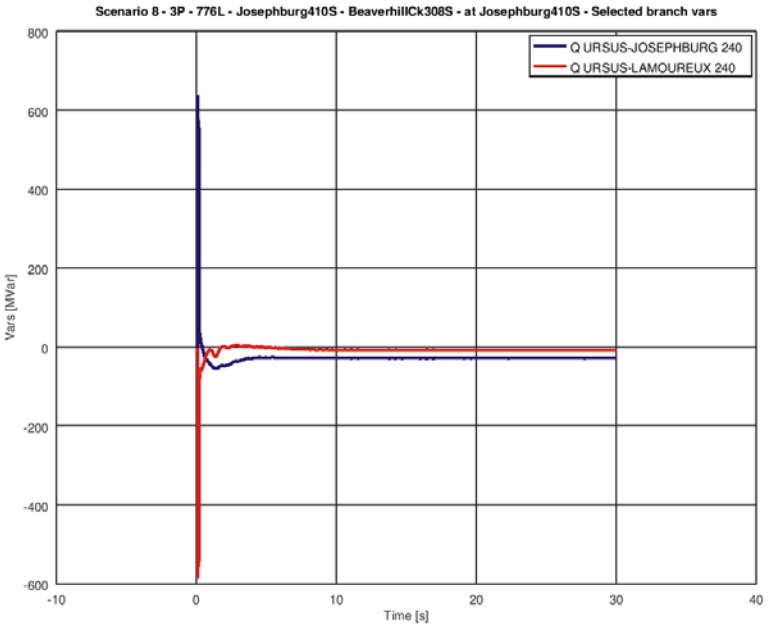


Figure A-1348 Scenario 8 - 3P - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

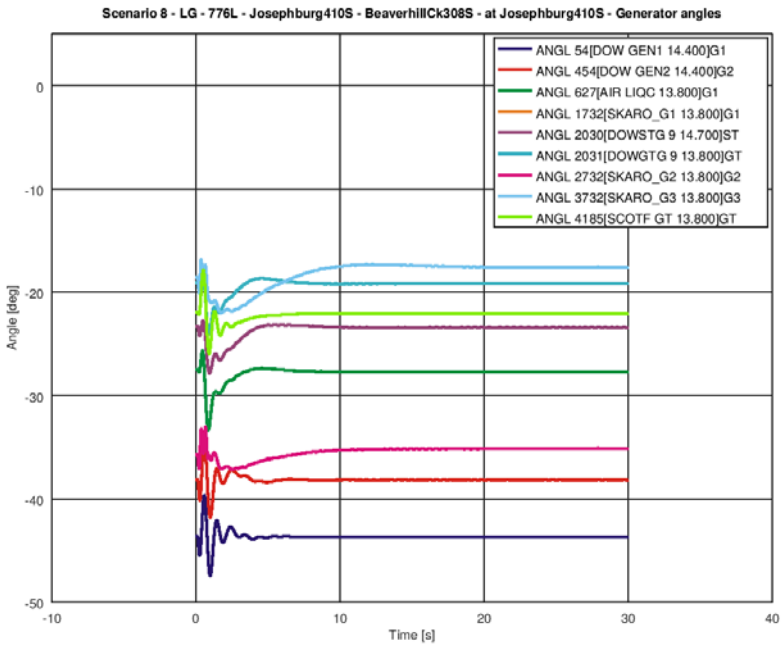


Figure A-1349 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

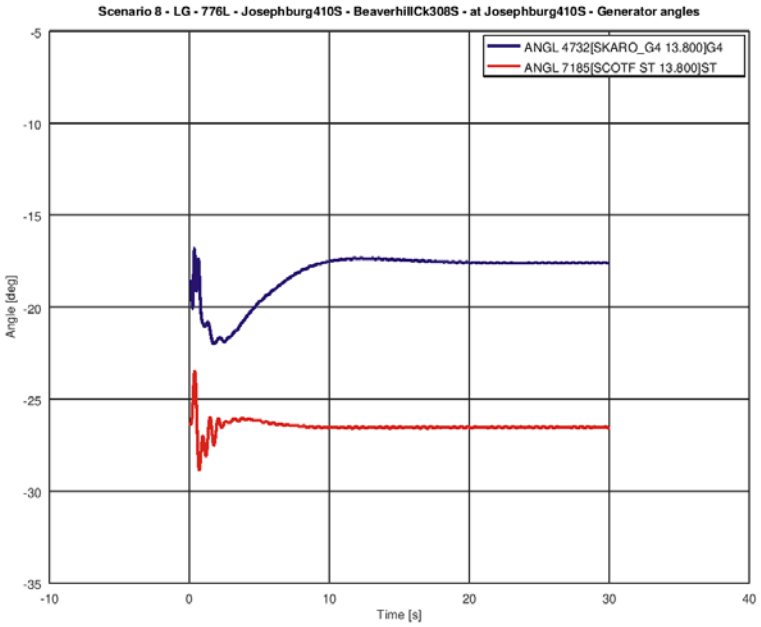


Figure A-1350 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator angles

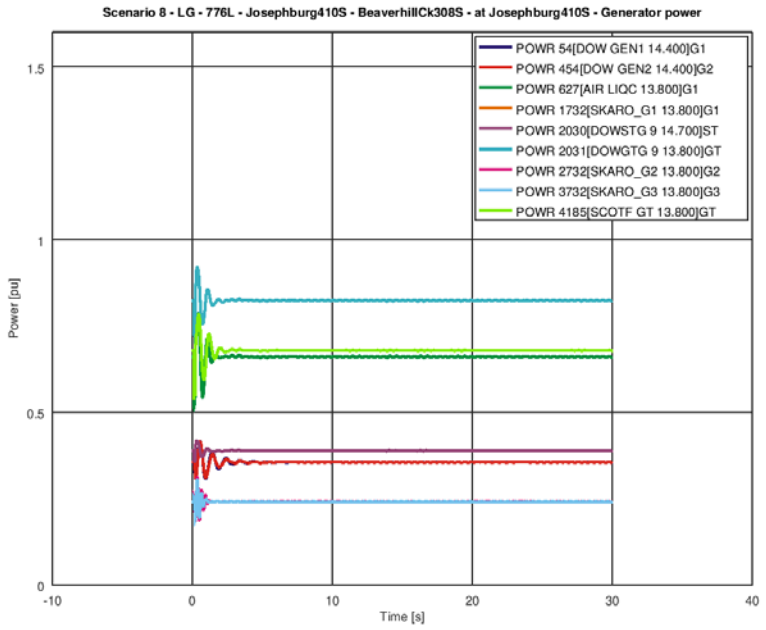


Figure A-1351 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

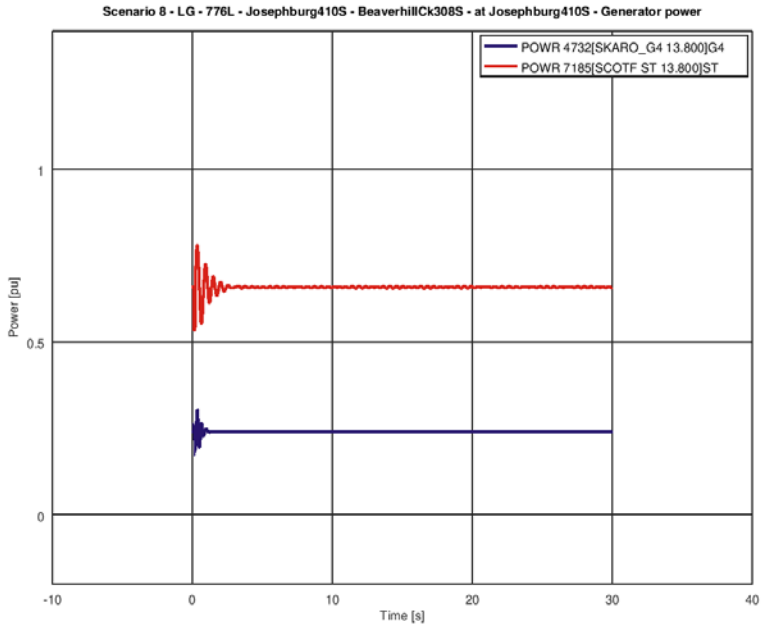


Figure A-1352 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator power

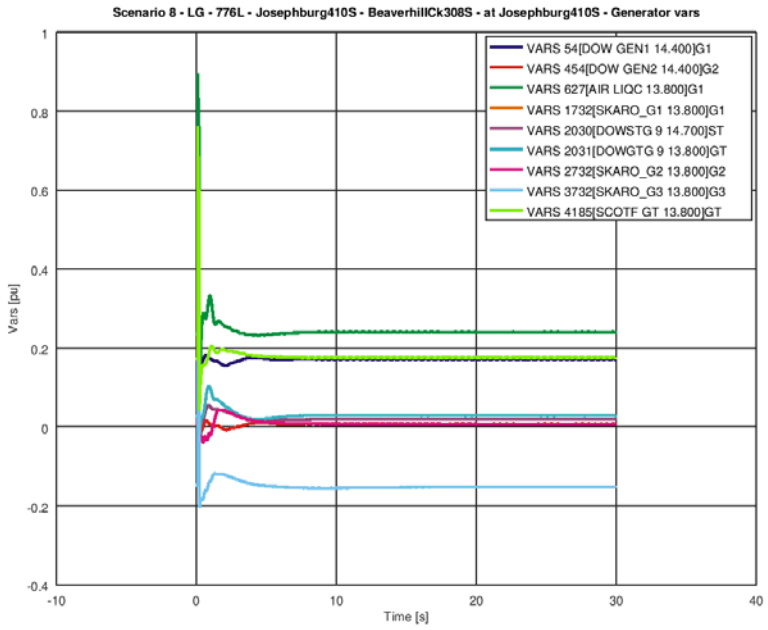


Figure A-1353 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

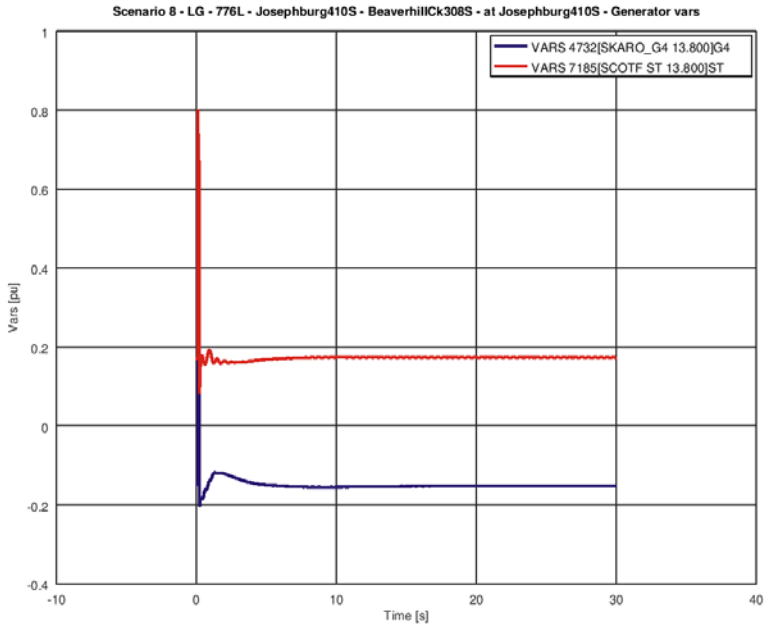


Figure A-1354 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Generator vars

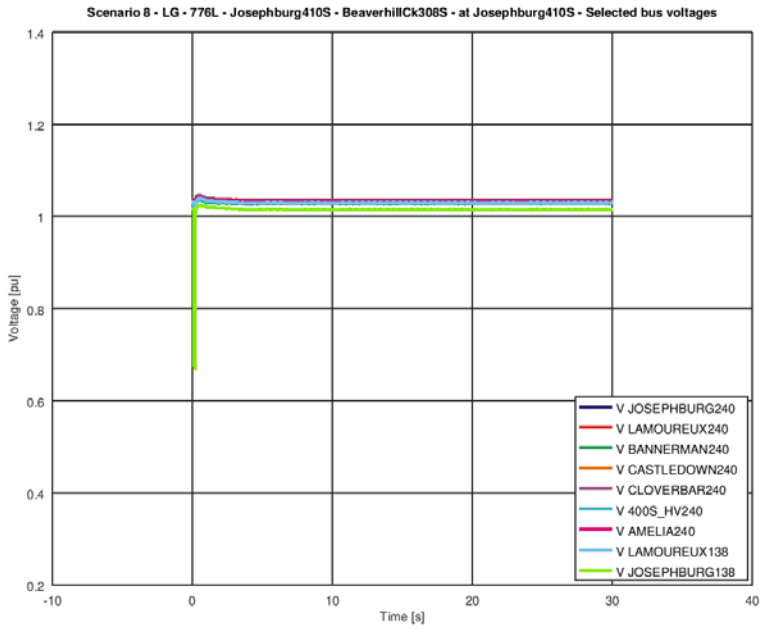


Figure A-1355 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

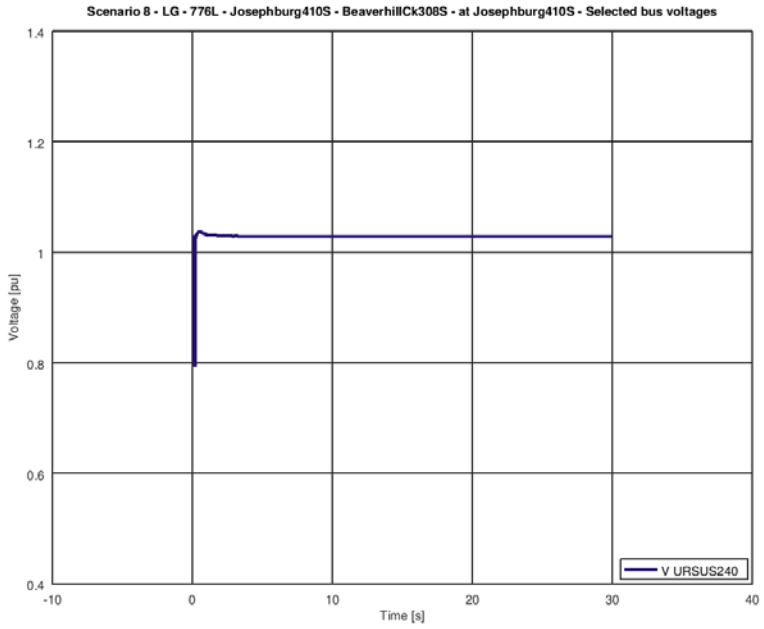


Figure A-1356 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected bus voltages

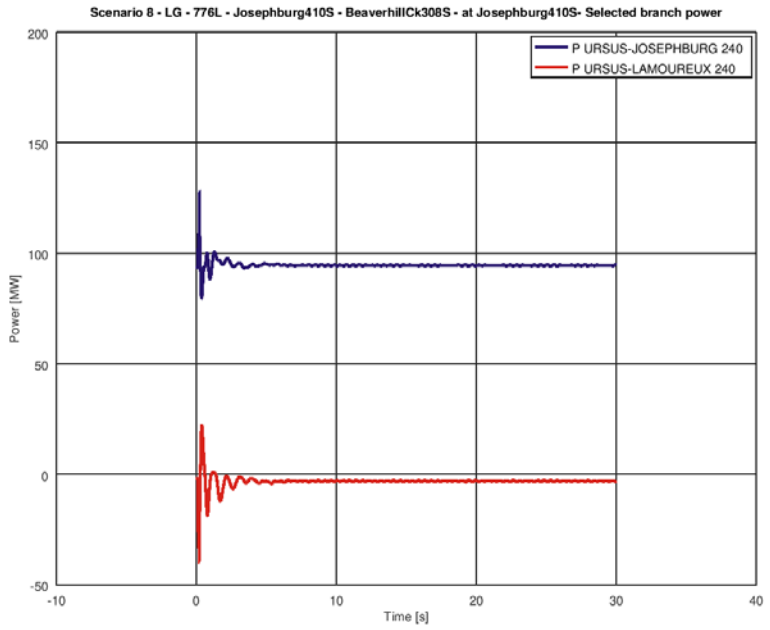


Figure A-1357 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch power

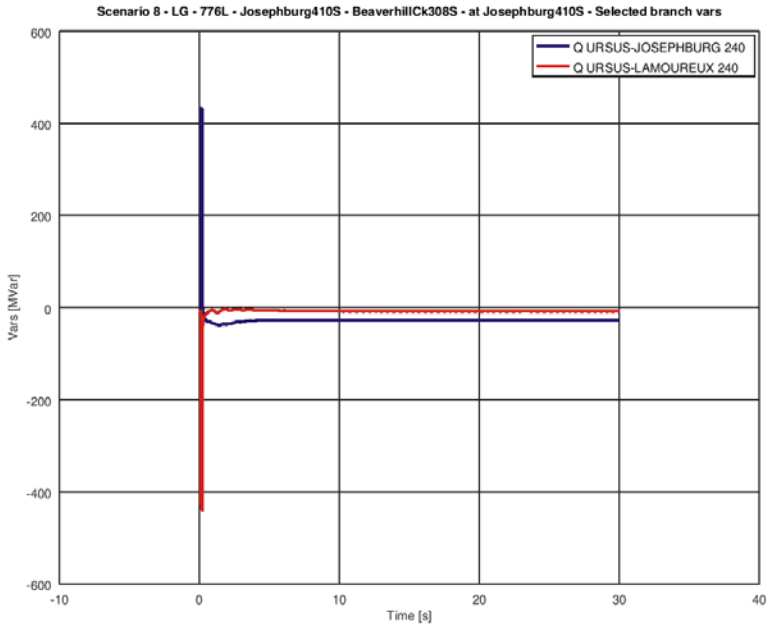


Figure A-1358 Scenario 8 - LG - 776L - Josephburg410S - BeaverhillCk308S - at Josephburg410S - Selected branch vars

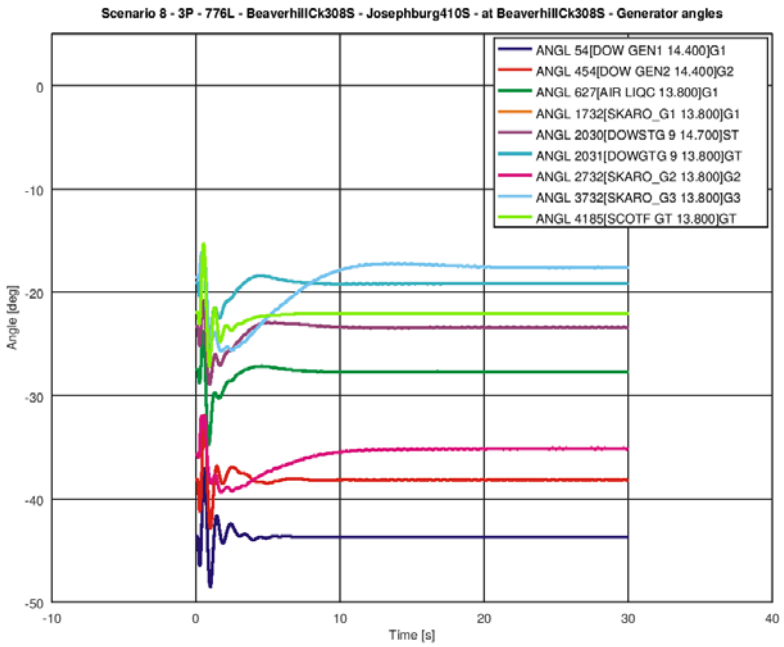


Figure A-1359 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

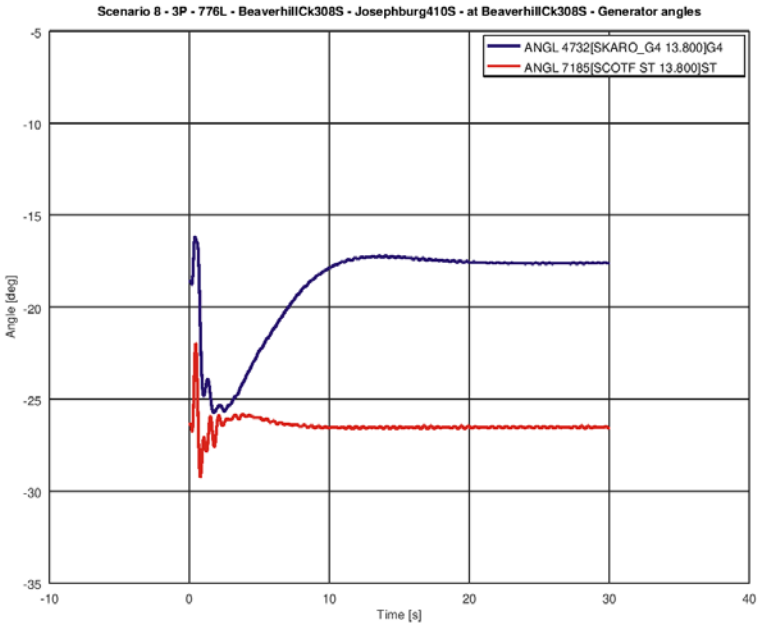


Figure A-1360 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

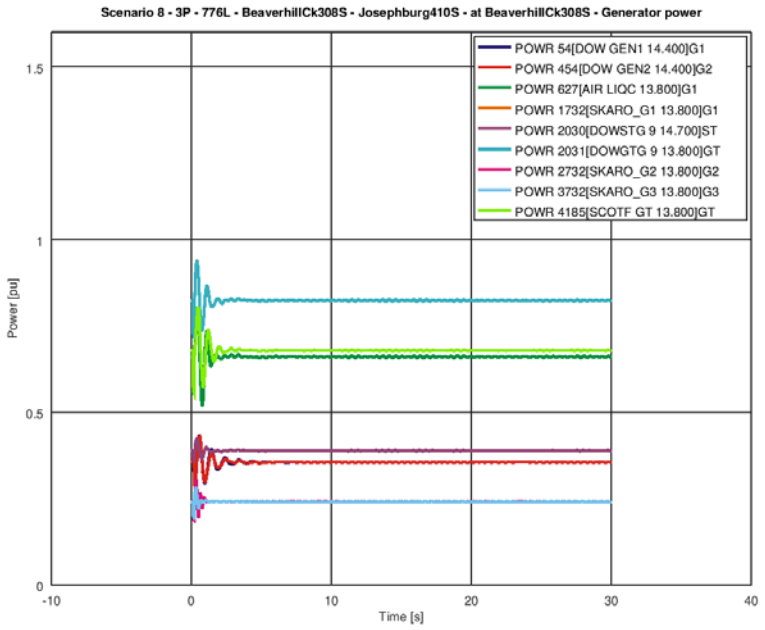


Figure A-1361 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

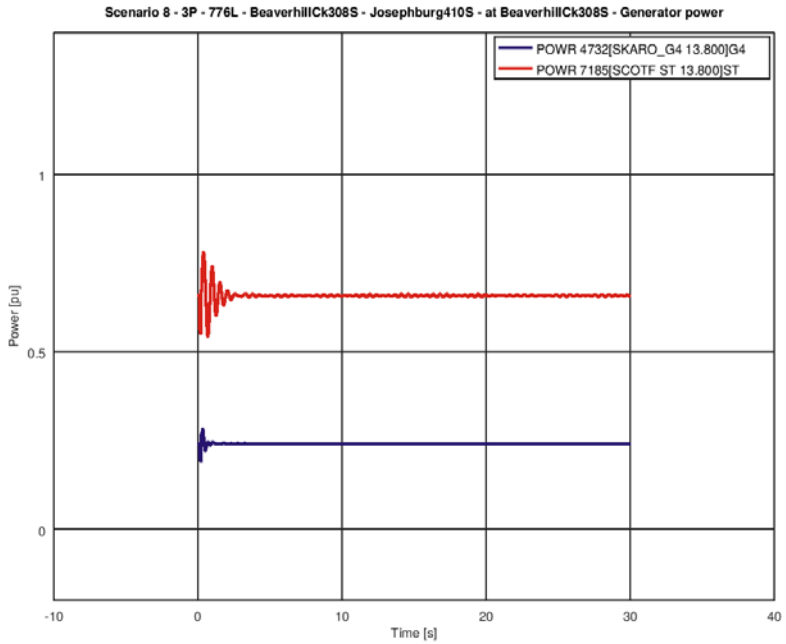


Figure A-1362 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

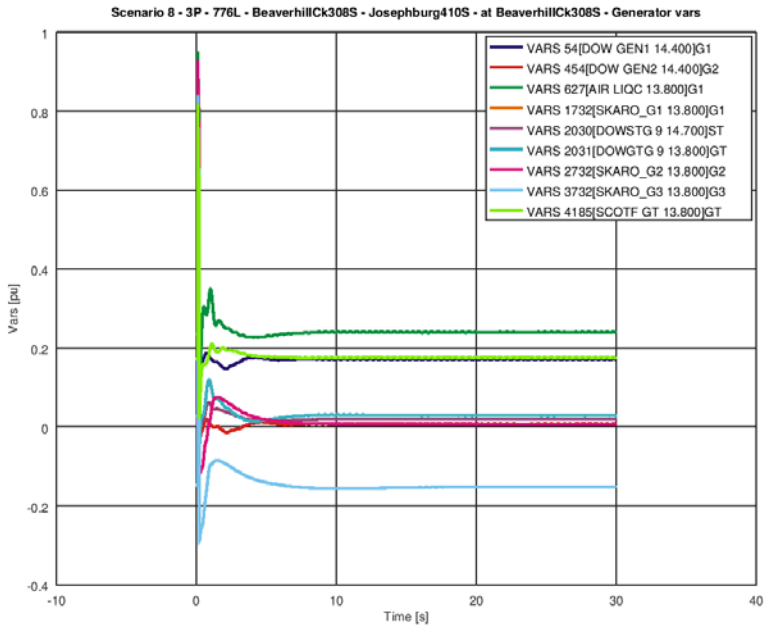


Figure A-1363 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

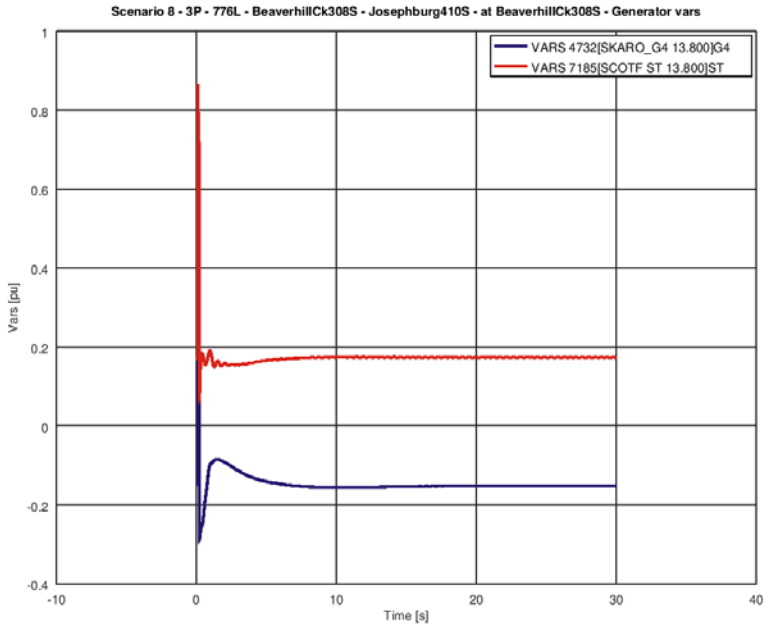


Figure A-1364 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

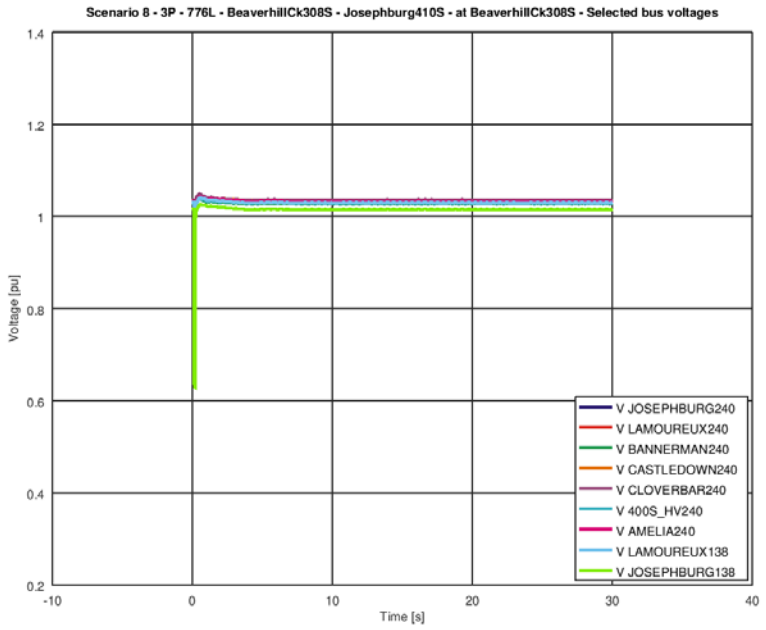


Figure A-1365 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

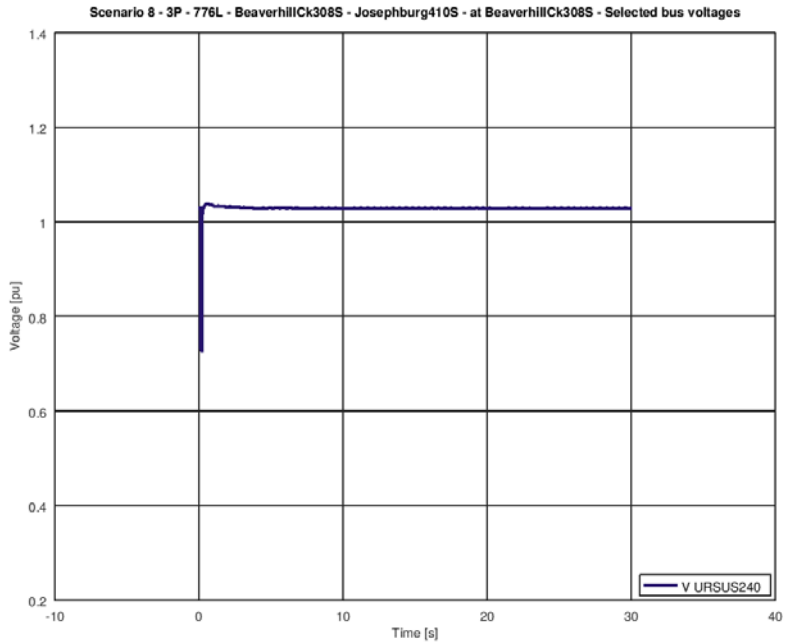


Figure A-1366 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

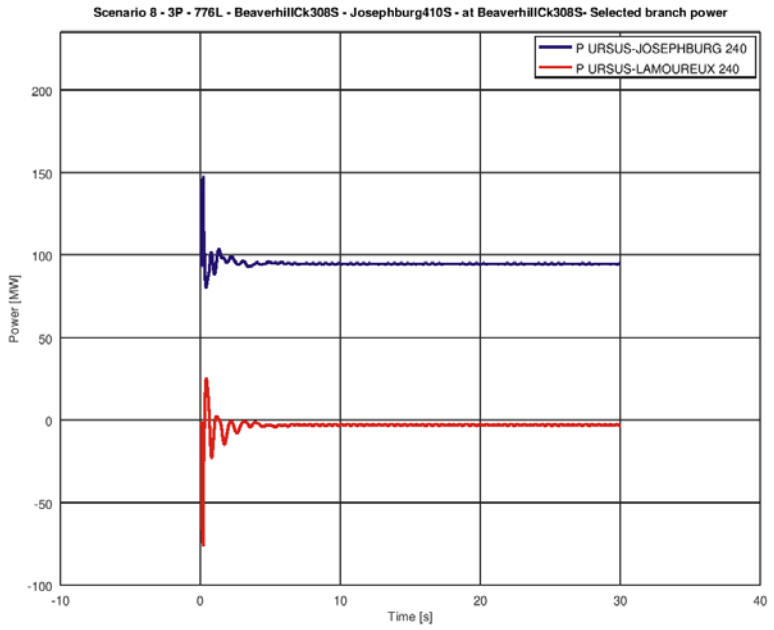


Figure A-1367 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

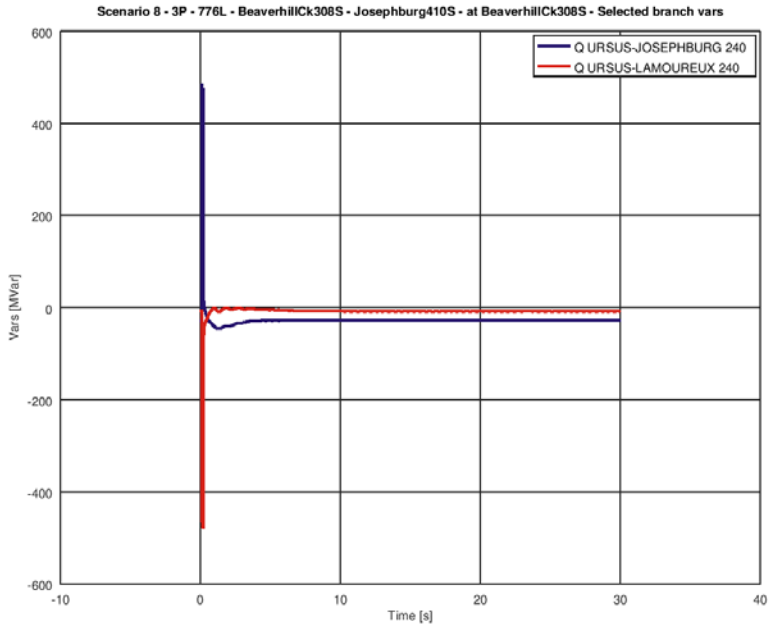


Figure A-1368 Scenario 8 - 3P - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

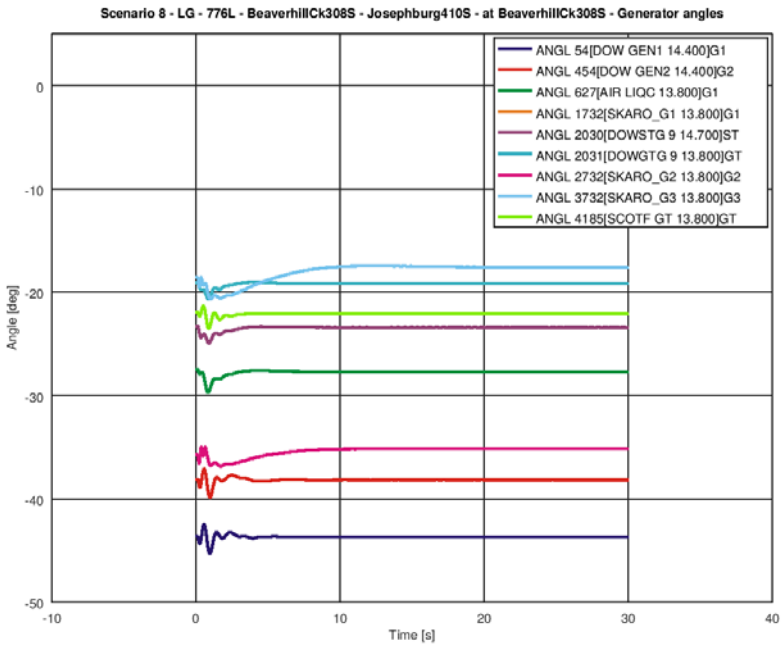


Figure A-1369 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

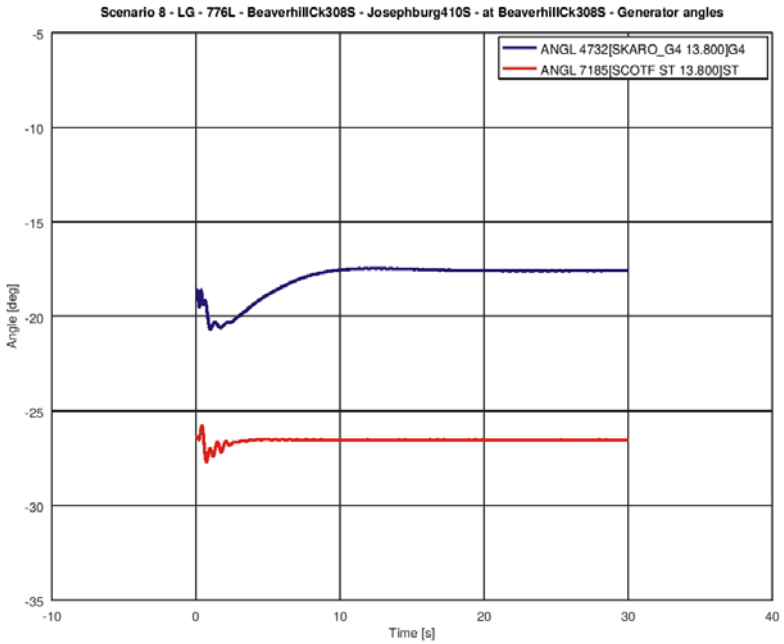


Figure A-1370 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator angles

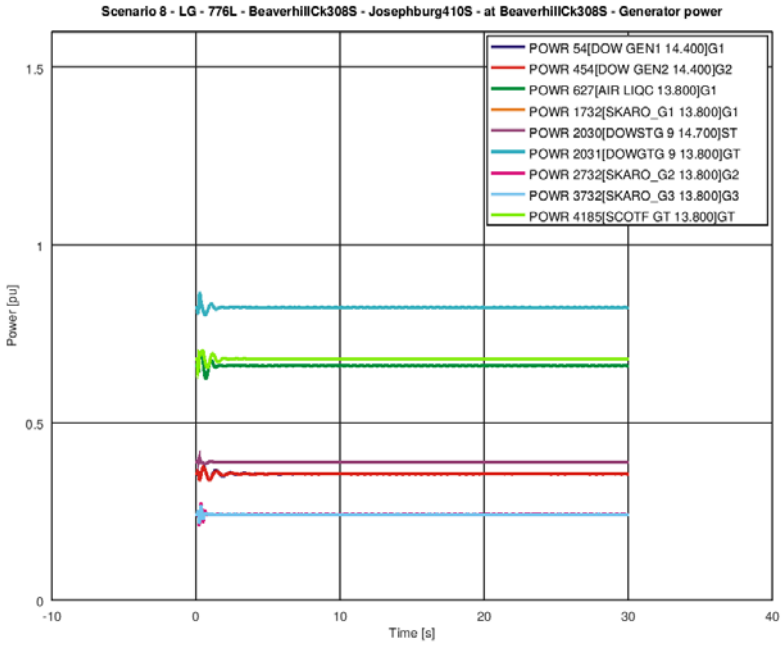


Figure A-1371 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

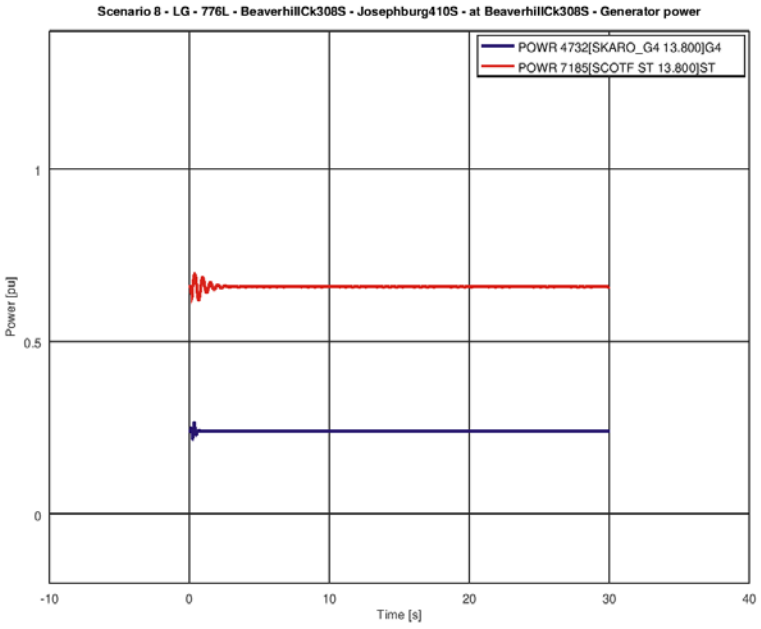


Figure A-1372 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator power

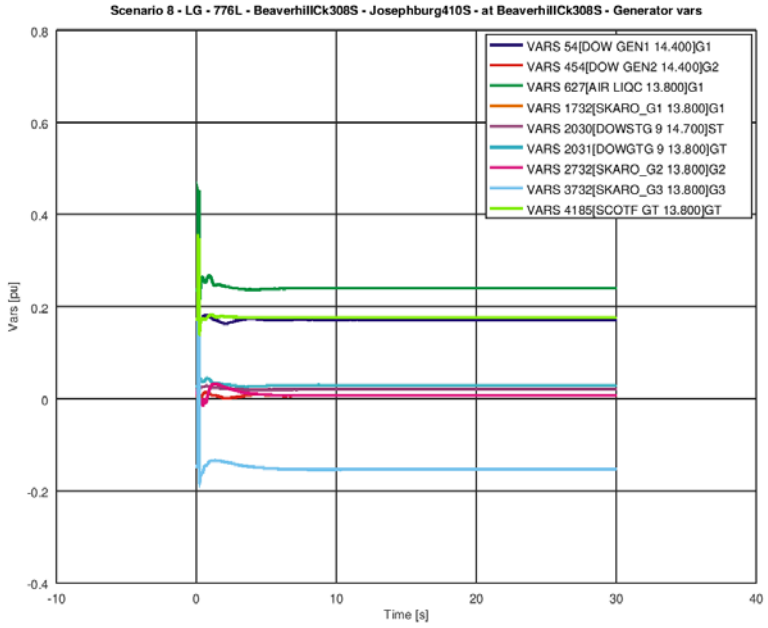


Figure A-1373 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

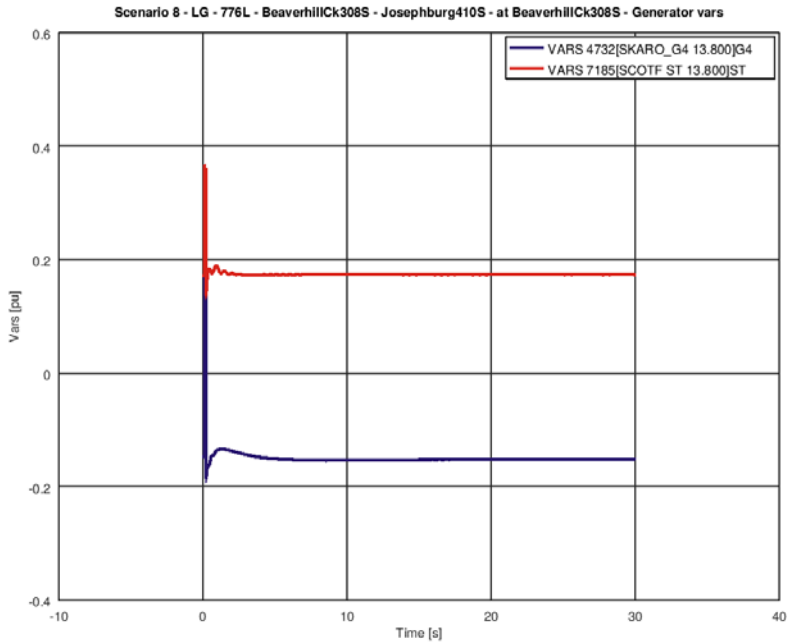


Figure A-1374 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Generator vars

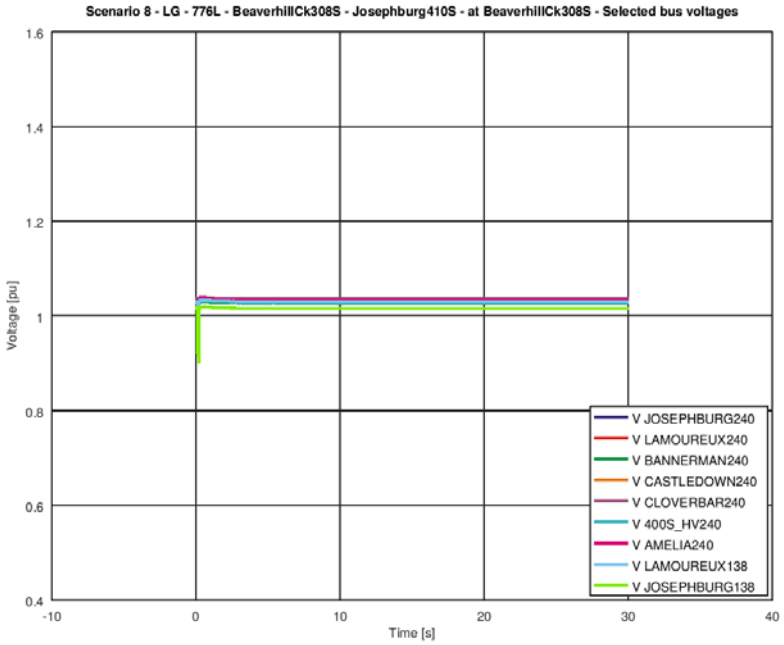


Figure A-1375 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

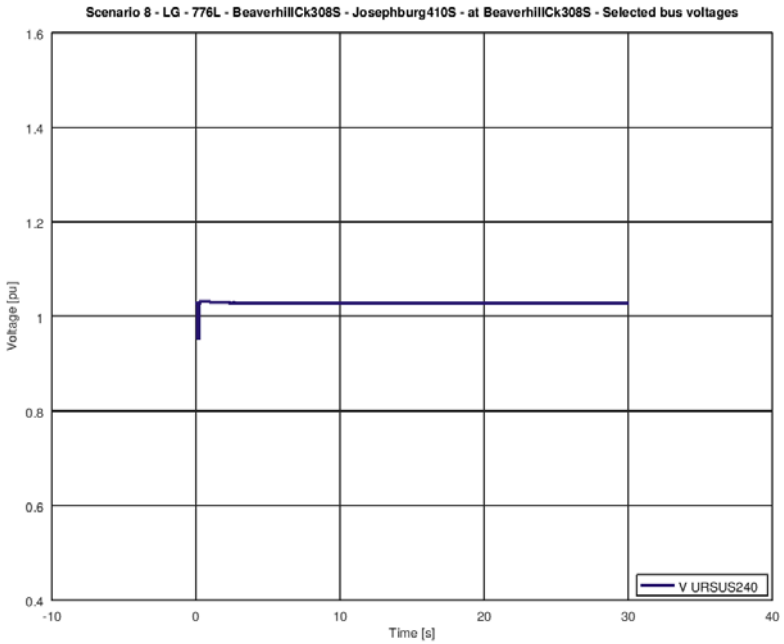


Figure A-1376 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected bus voltages

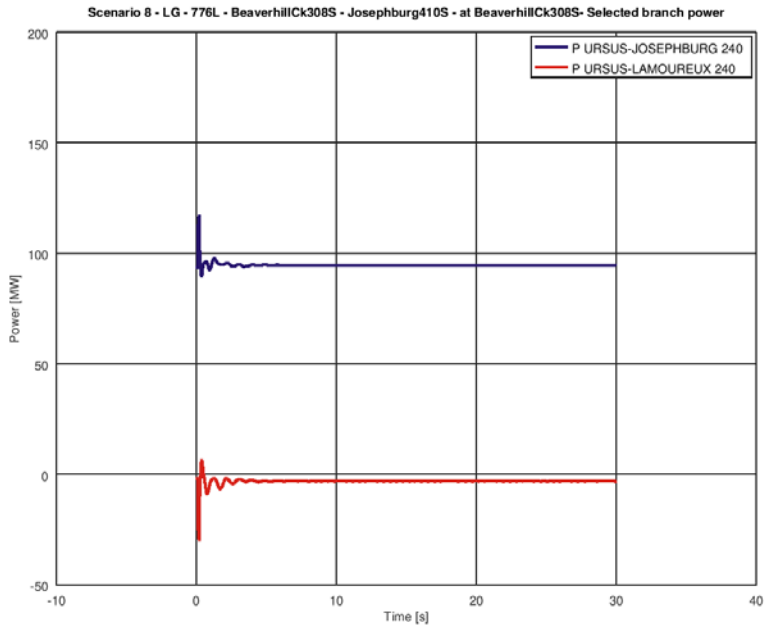


Figure A-1377 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch power

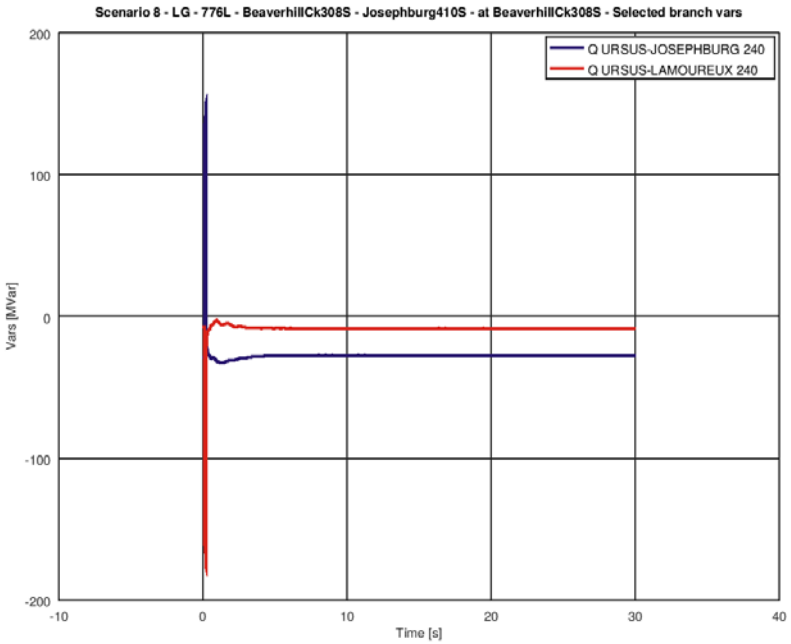


Figure A-1378 Scenario 8 - LG - 776L - BeaverhillCk308S - Josephburg410S - at BeaverhillCk308S - Selected branch vars

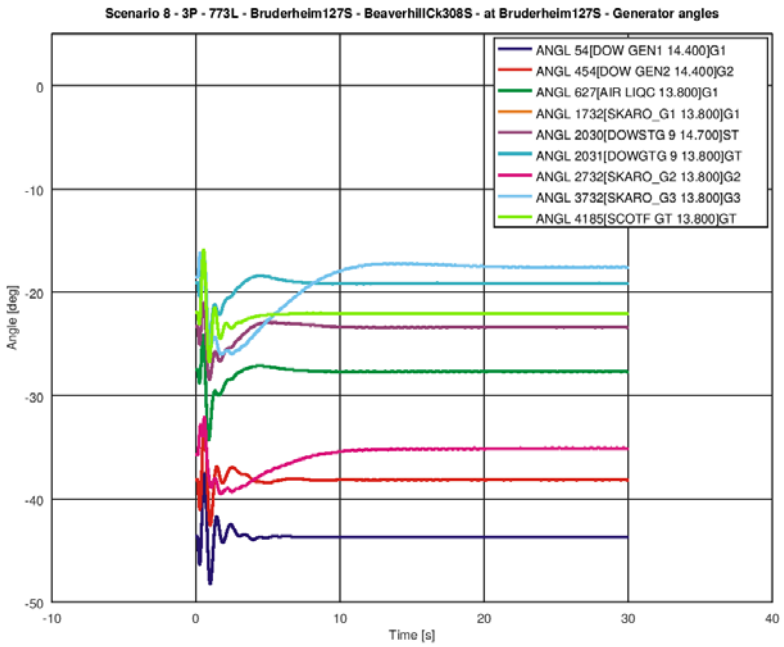


Figure A-1379 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

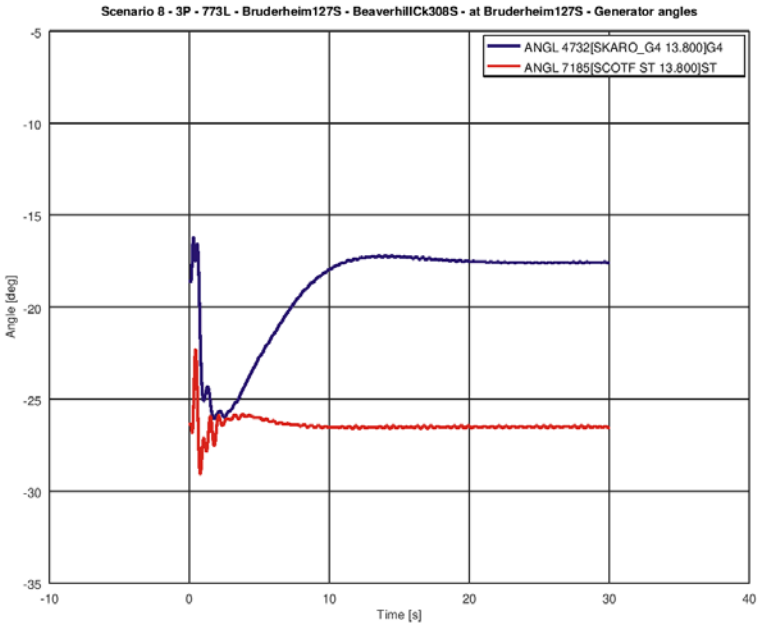


Figure A-1380 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

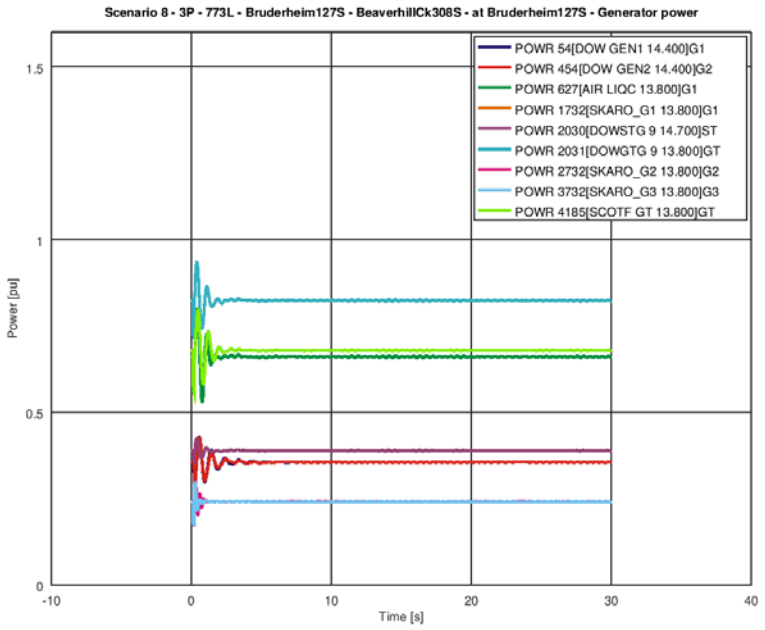


Figure A-1381 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

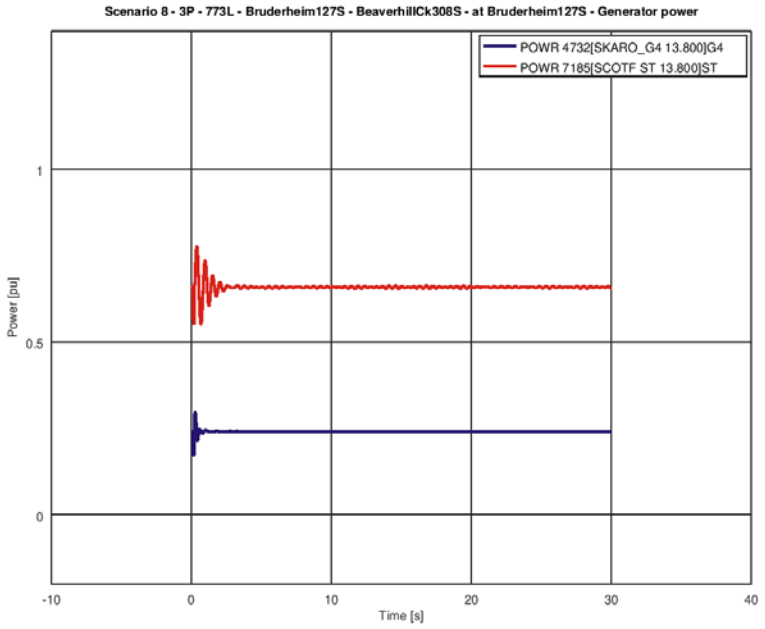


Figure A-1382 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

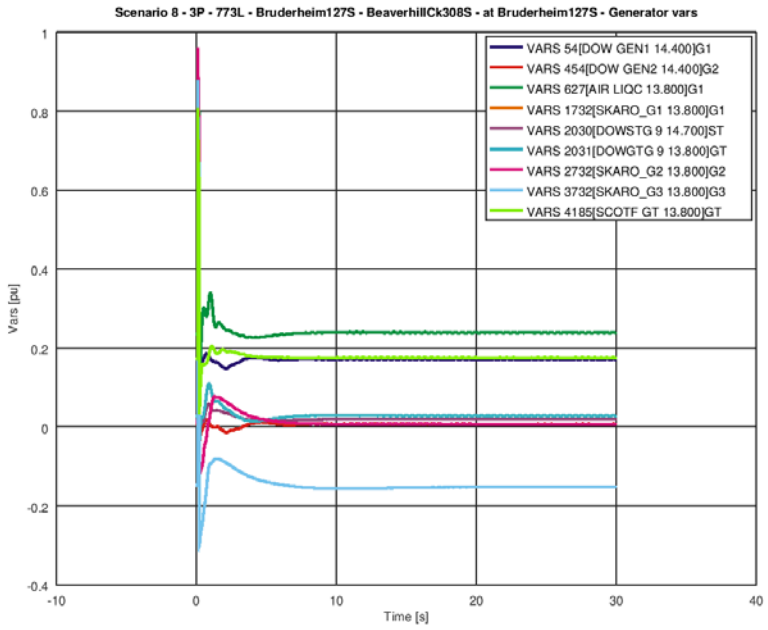


Figure A-1383 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

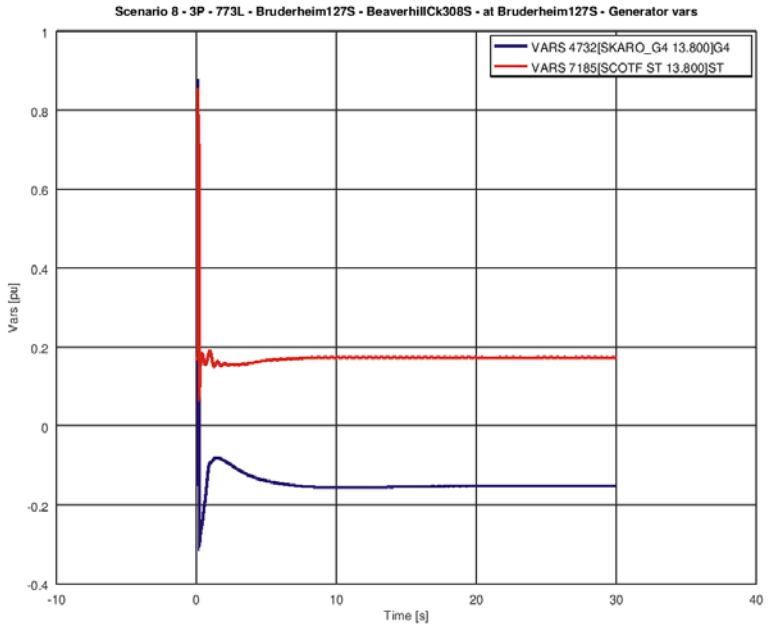


Figure A-1384 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

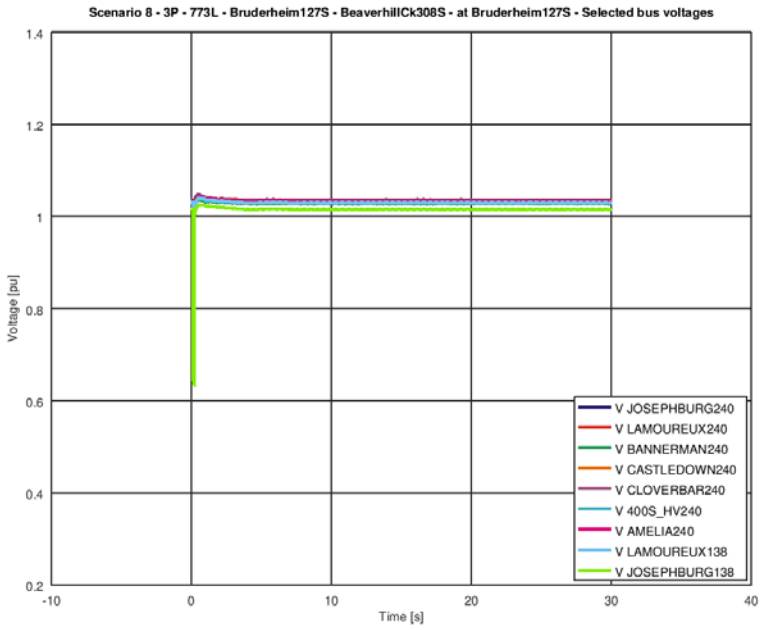


Figure A-1385 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

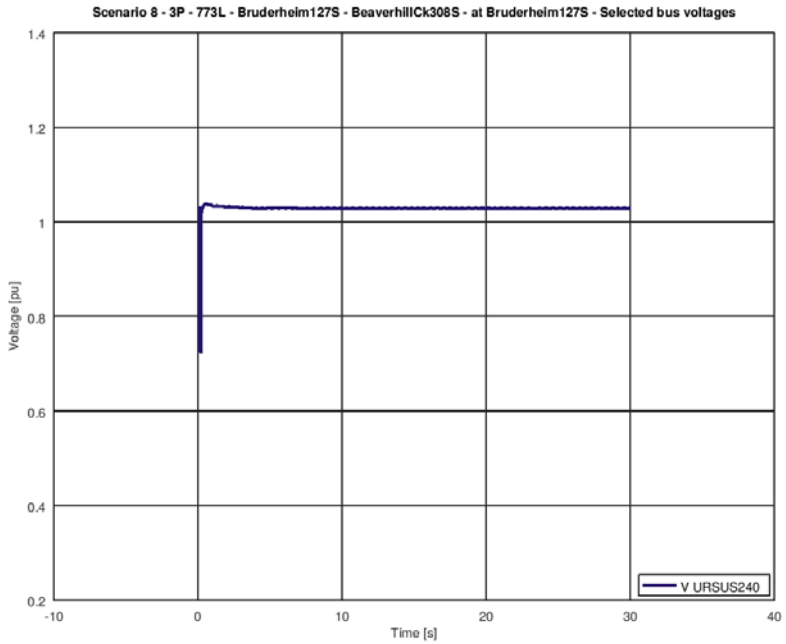


Figure A-1386 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

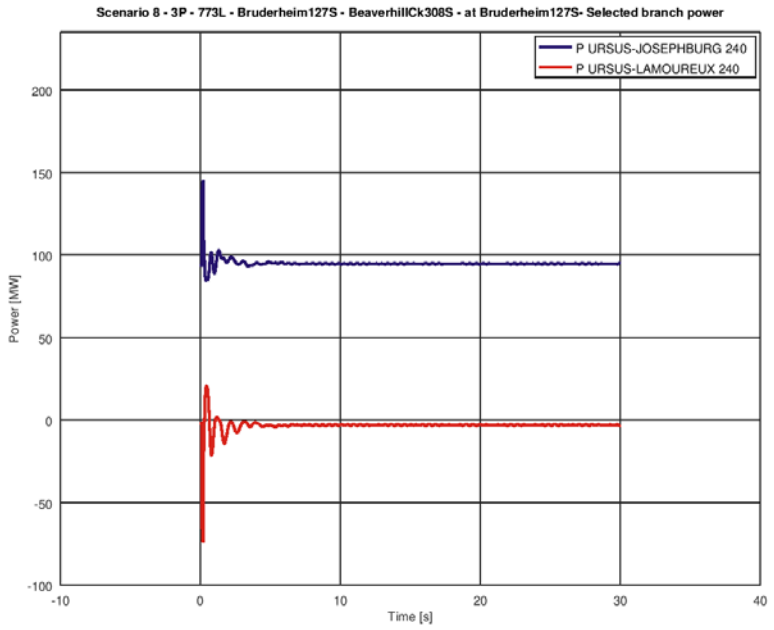


Figure A-1387 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

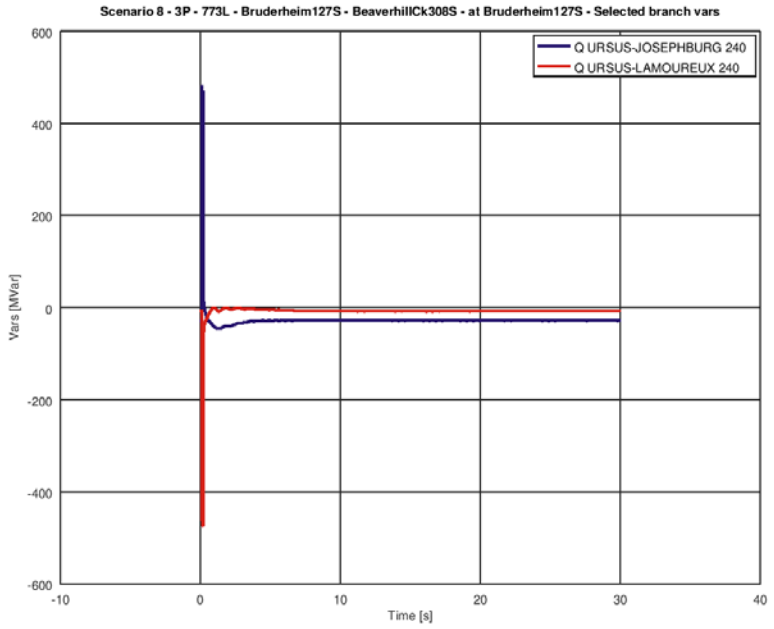


Figure A-1388 Scenario 8 - 3P - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

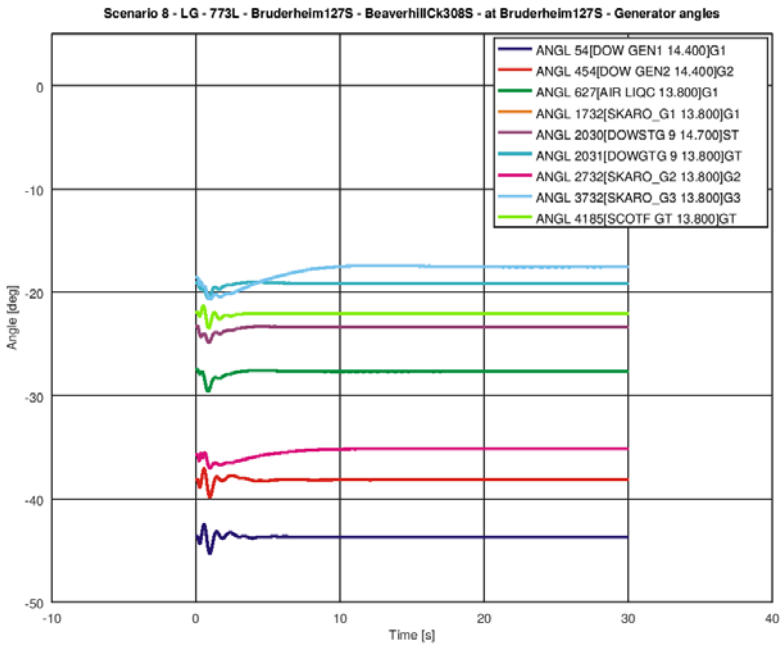


Figure A-1389 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

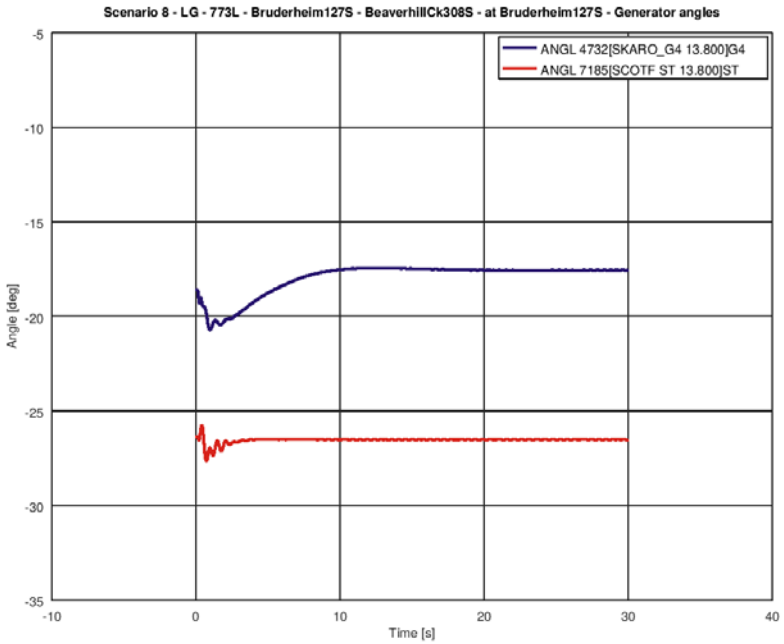


Figure A-1390 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator angles

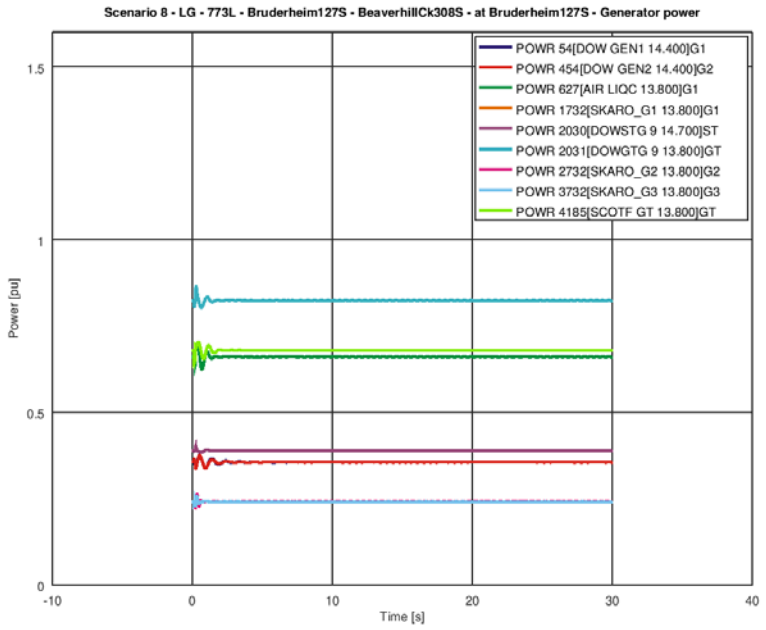


Figure A-1391 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

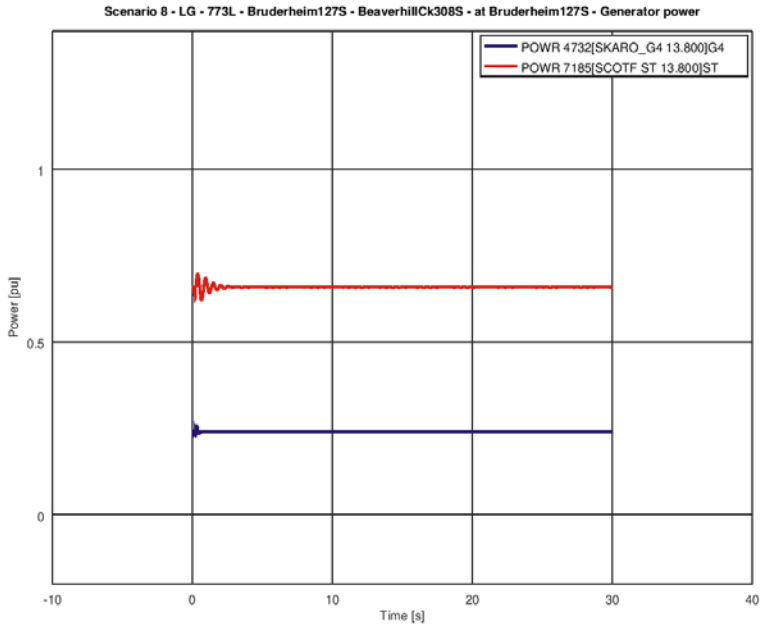


Figure A-1392 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator power

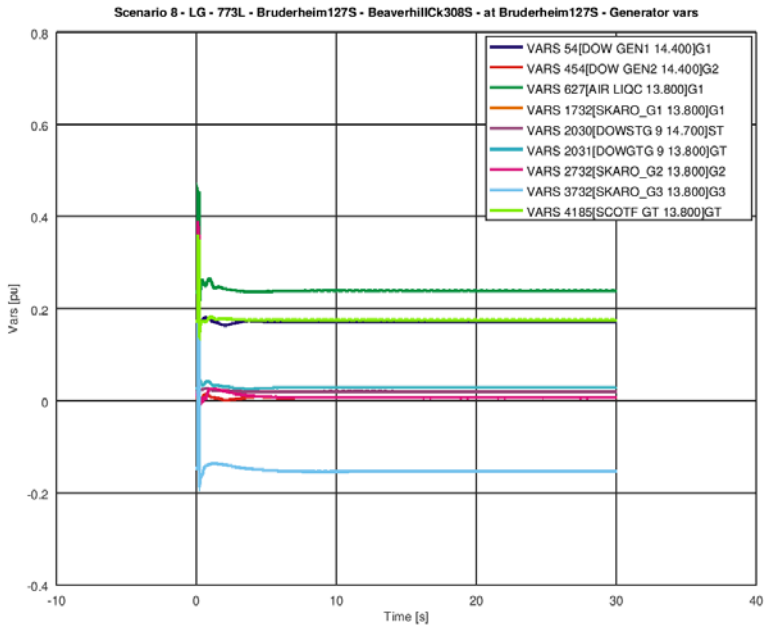


Figure A-1393 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

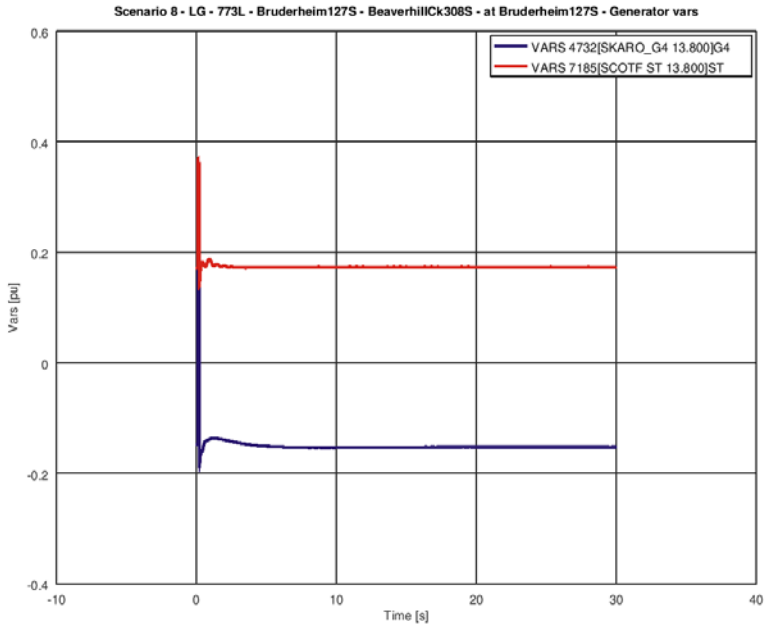


Figure A-1394 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Generator vars

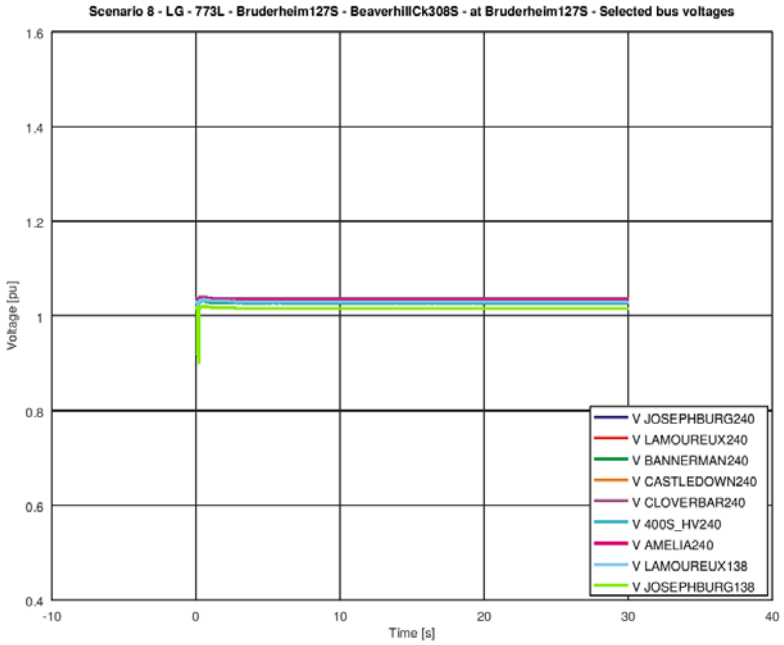


Figure A-1395 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

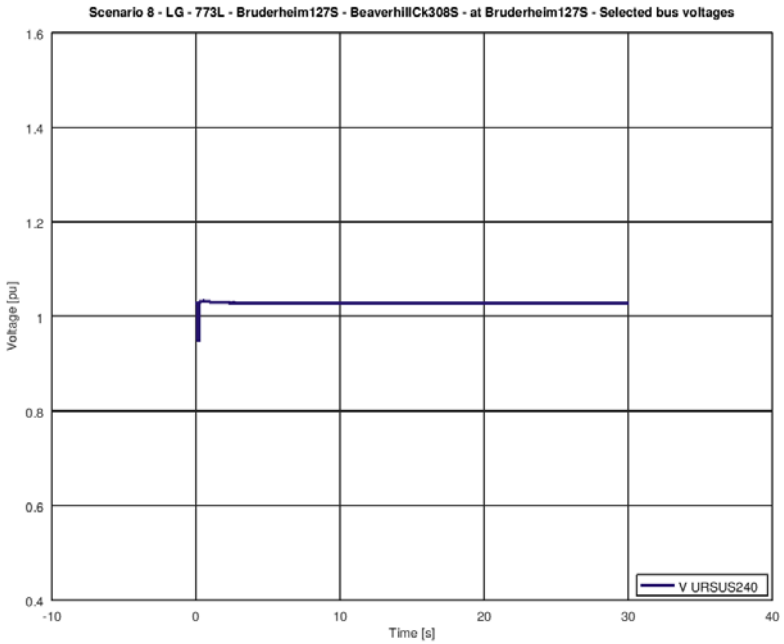


Figure A-1396 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected bus voltages

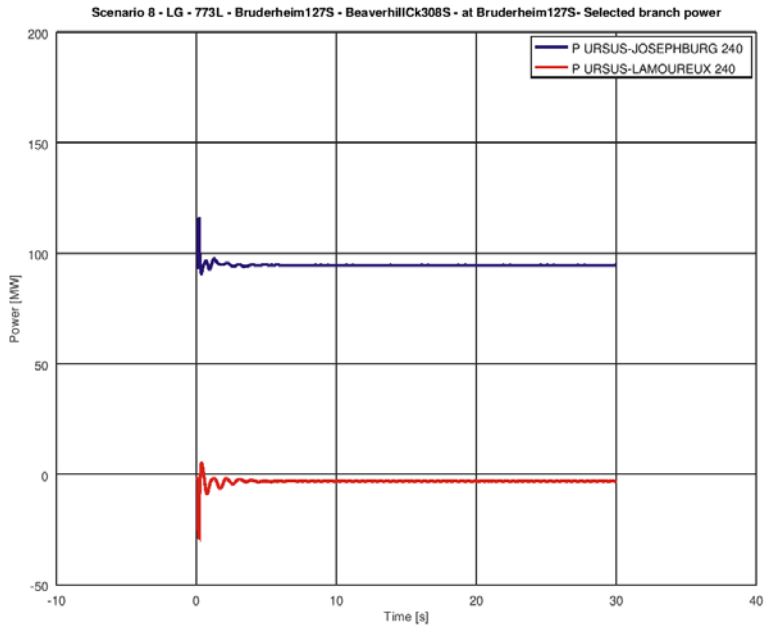


Figure A-1397 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch power

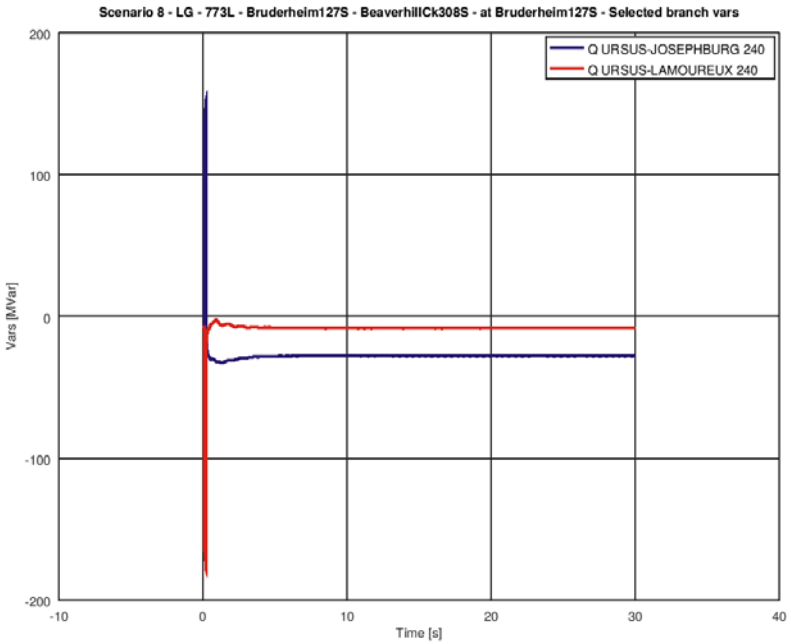


Figure A-1398 Scenario 8 - LG - 773L - Bruderheim127S - BeaverhillCk308S - at Bruderheim127S - Selected branch vars

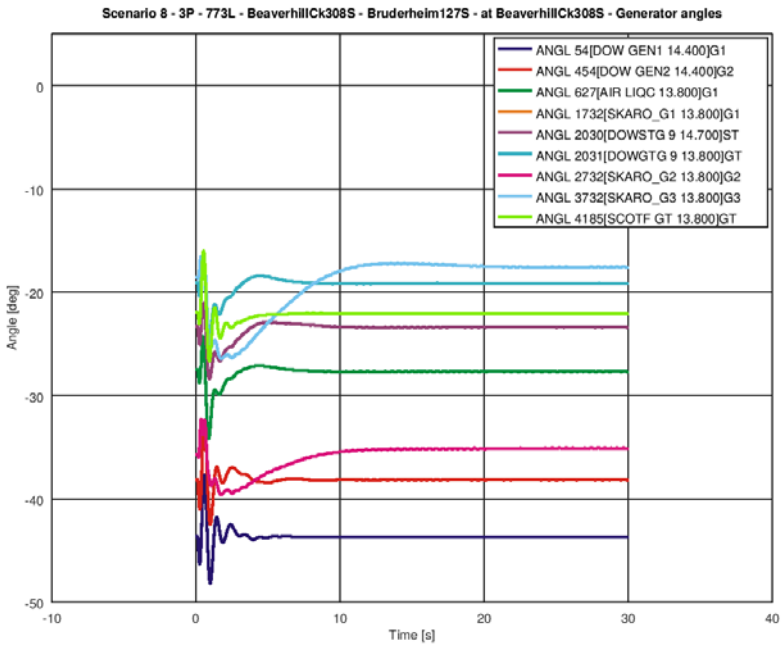


Figure A-1399 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

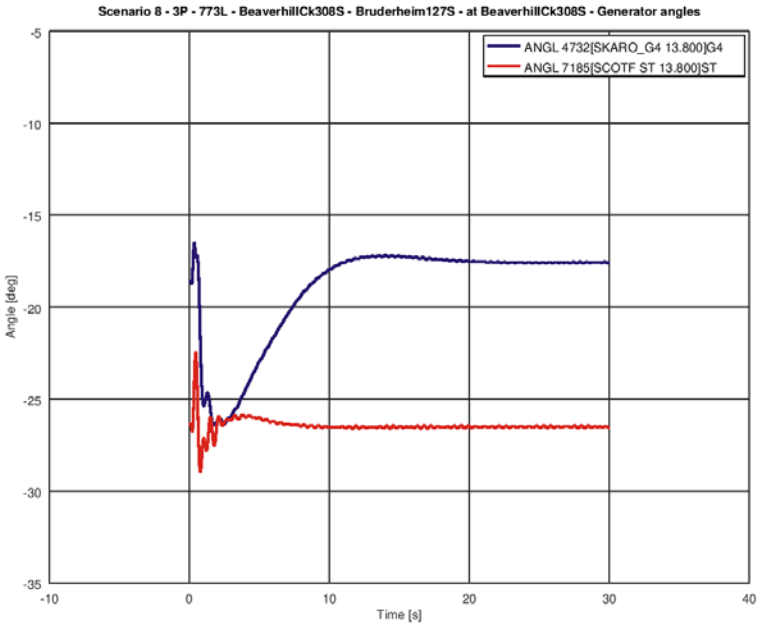


Figure A-1400 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

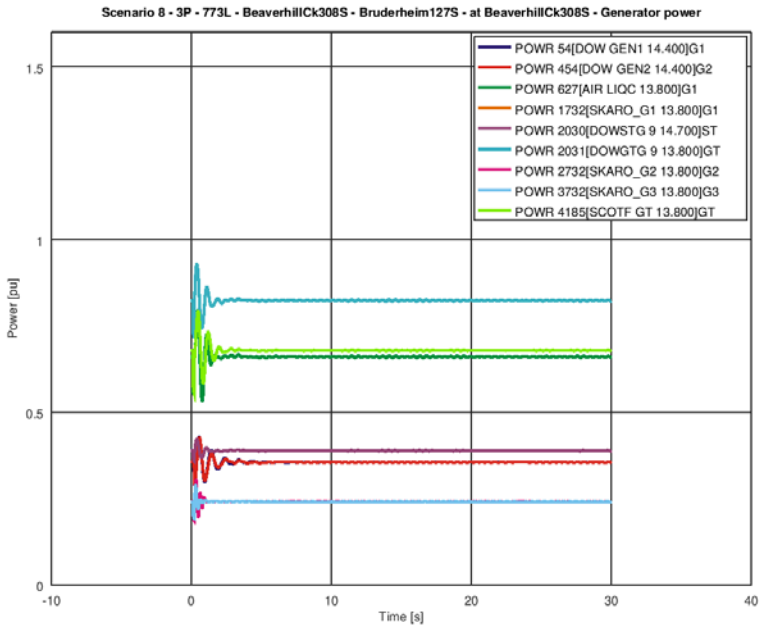


Figure A-1401 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

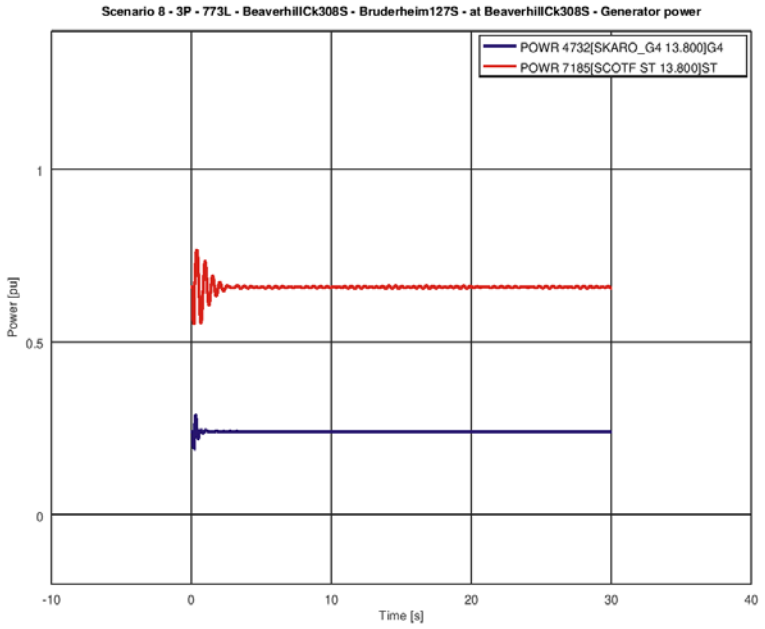


Figure A-1402 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

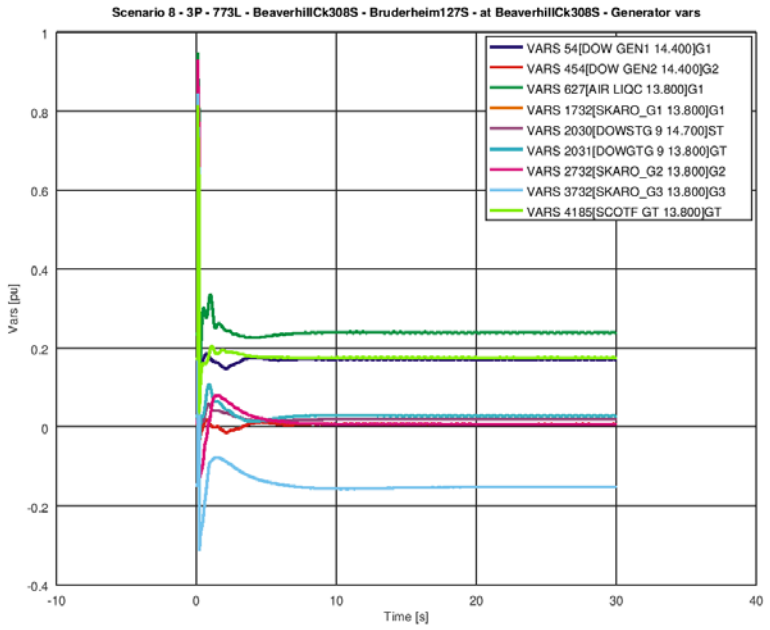


Figure A-1403 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

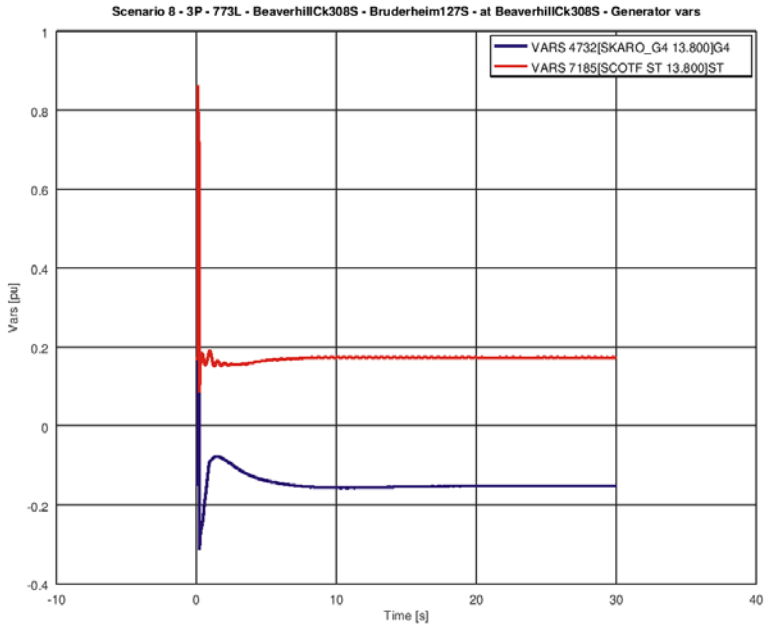


Figure A-1404 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

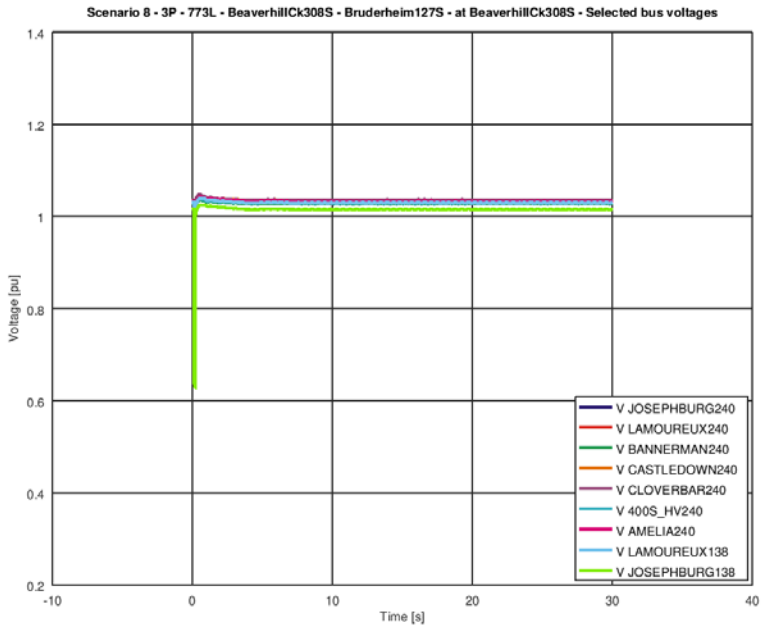


Figure A-1405 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

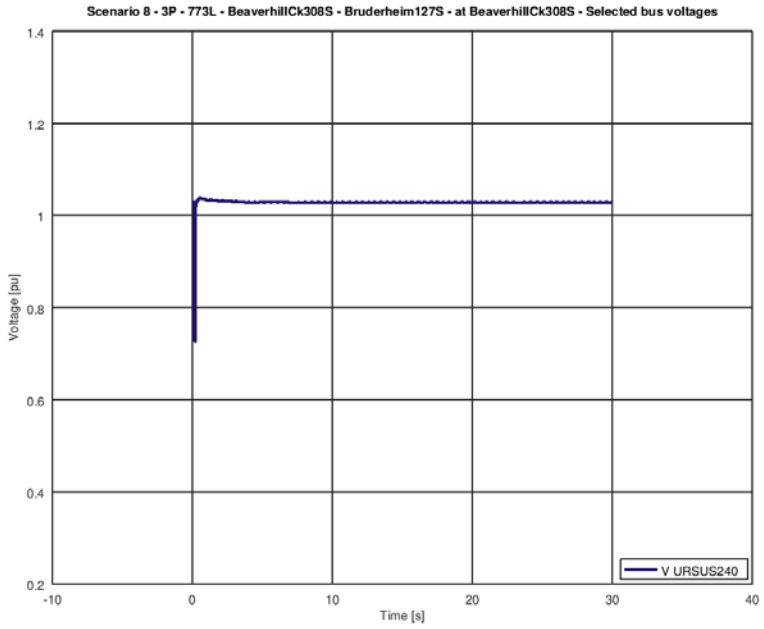


Figure A-1406 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

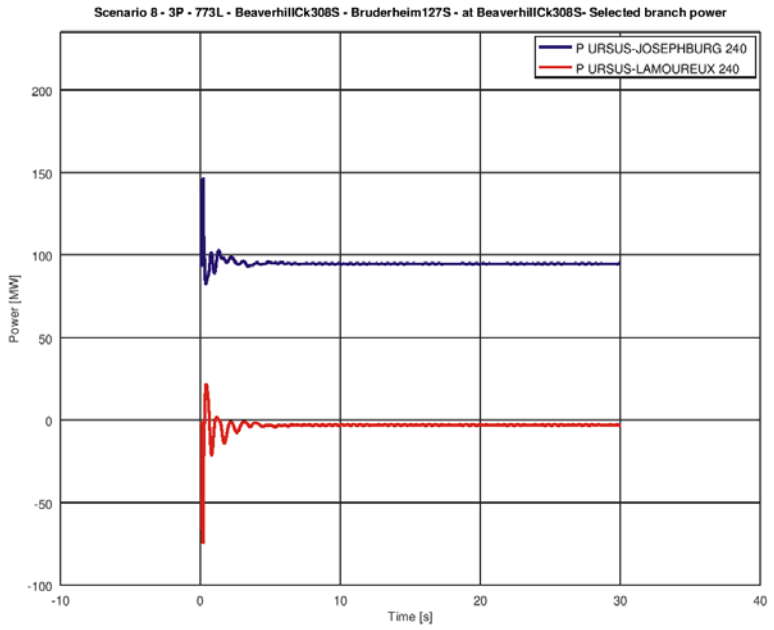


Figure A-1407 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

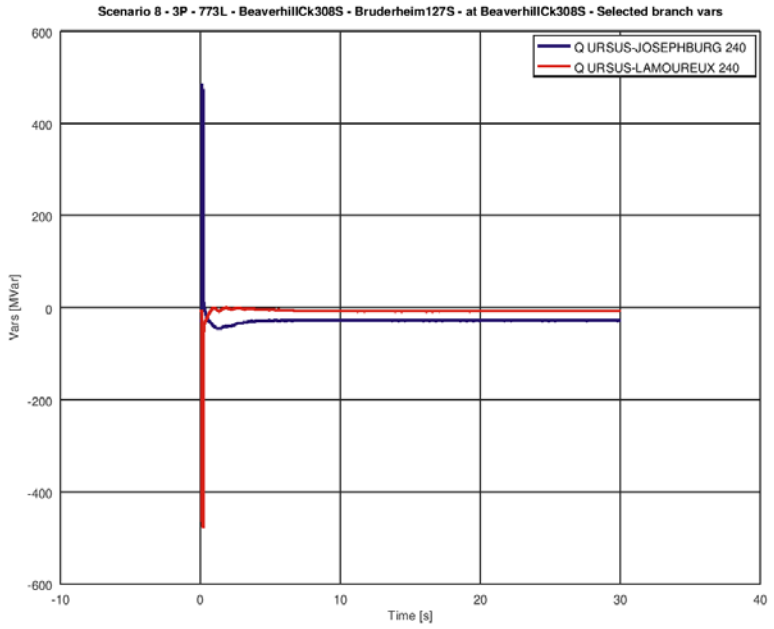


Figure A-1408 Scenario 8 - 3P - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

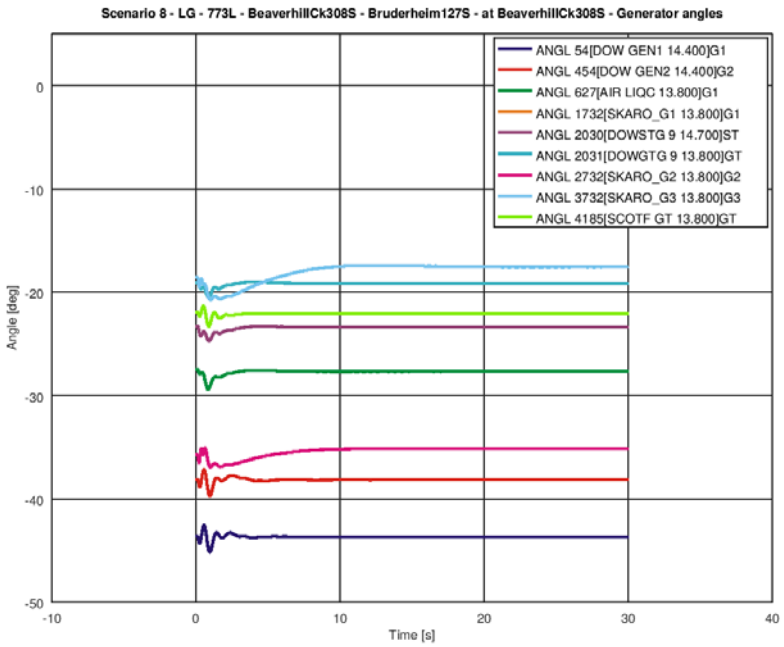


Figure A-1409 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

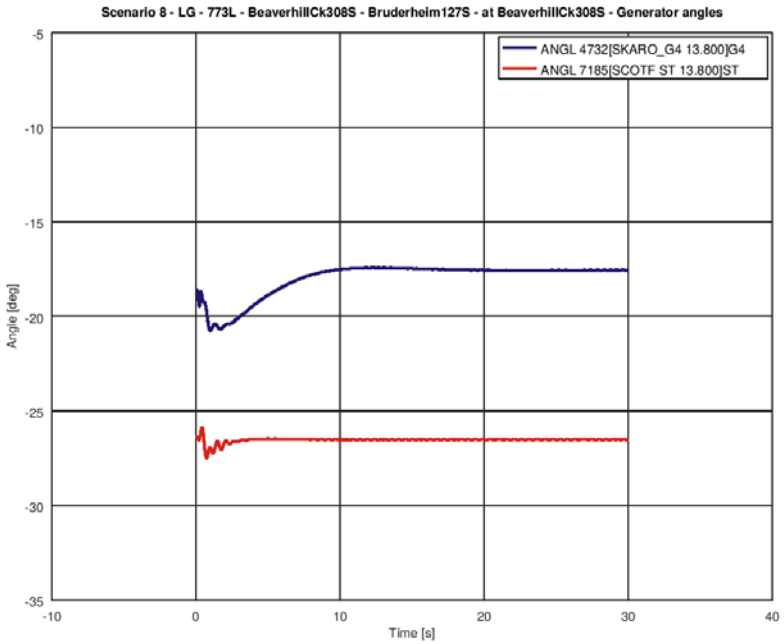


Figure A-1410 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator angles

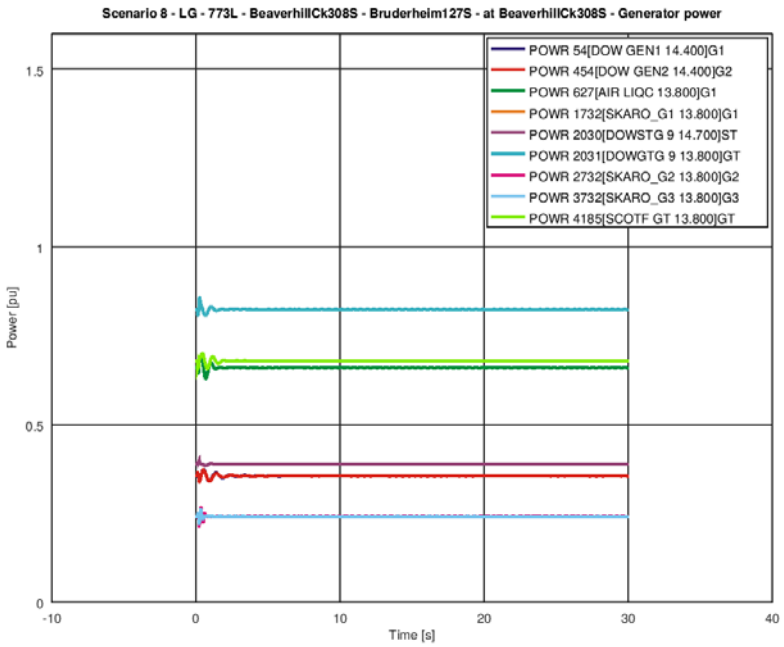


Figure A-1411 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

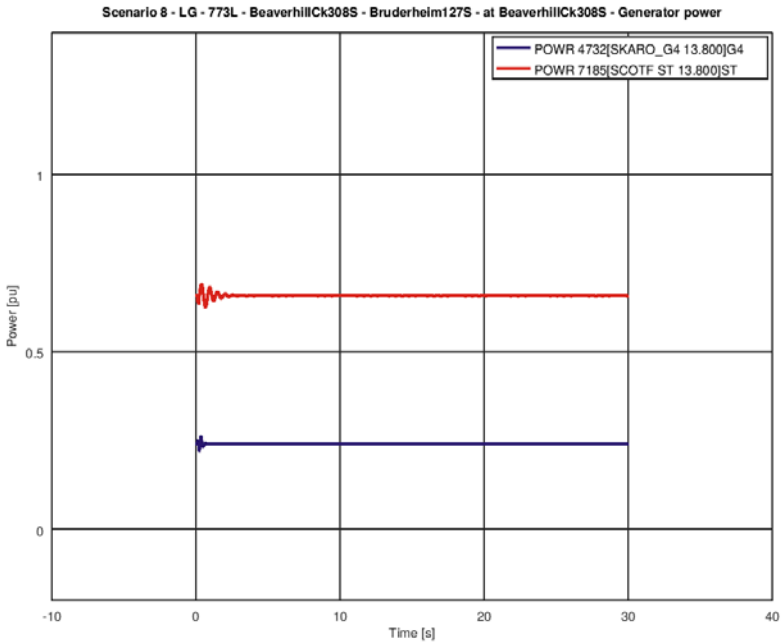


Figure A-1412 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator power

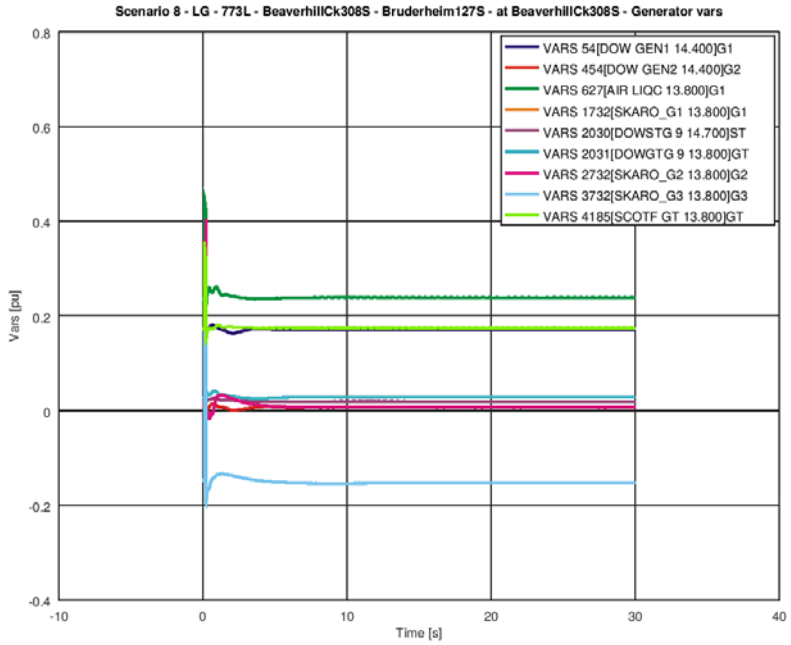


Figure A-1413 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

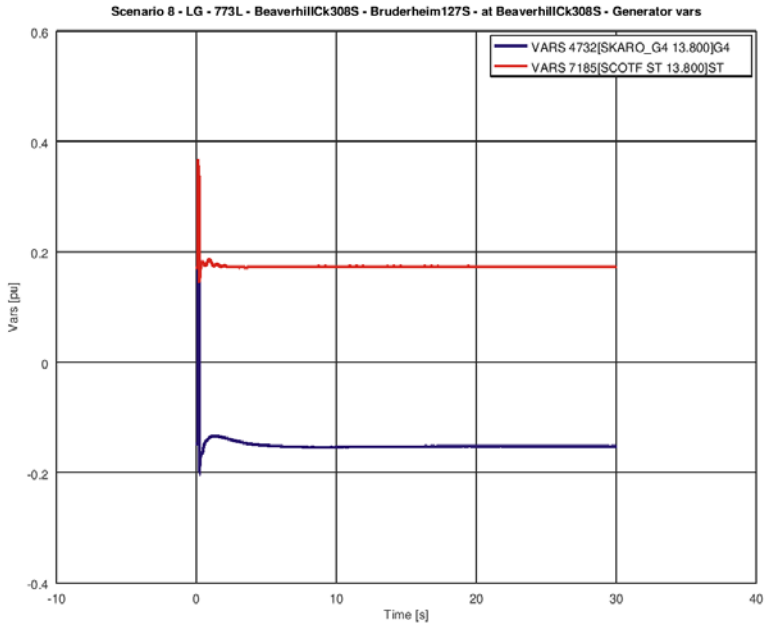


Figure A-1414 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Generator vars

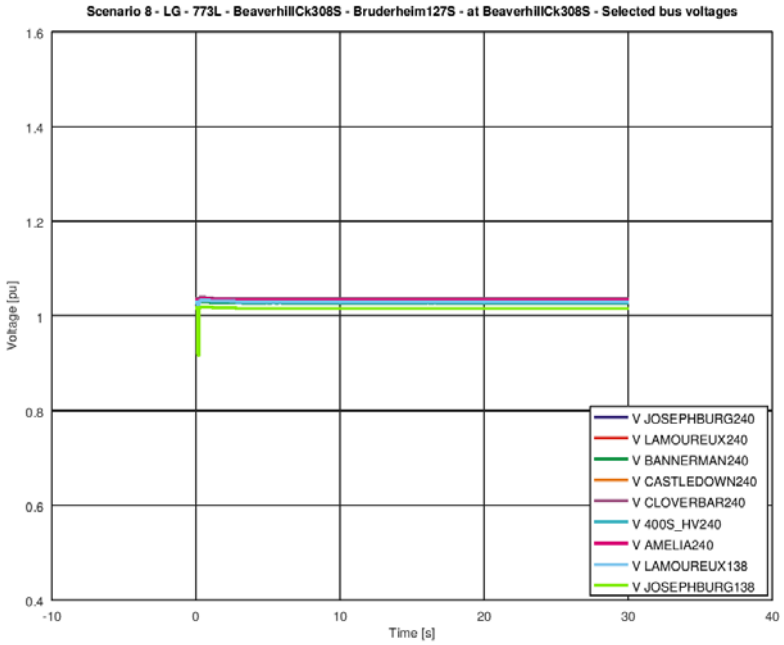


Figure A-1415 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

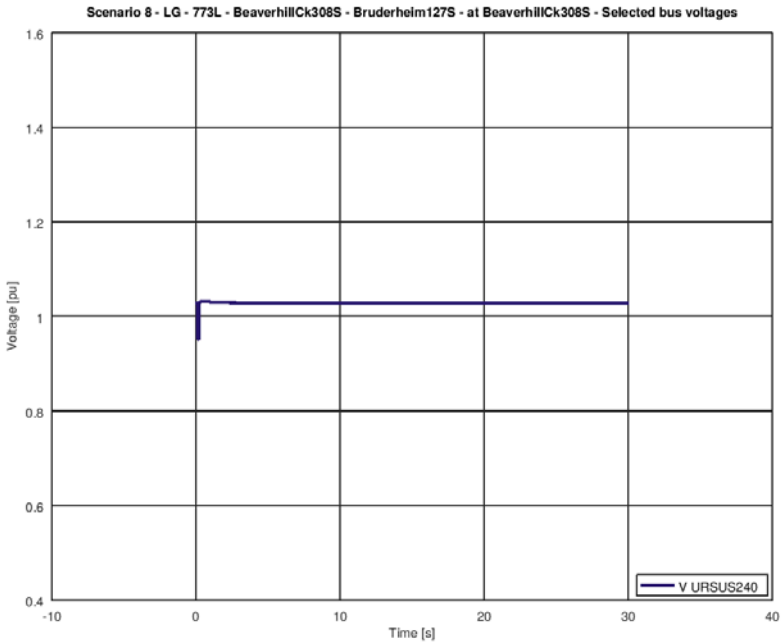


Figure A-1416 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected bus voltages

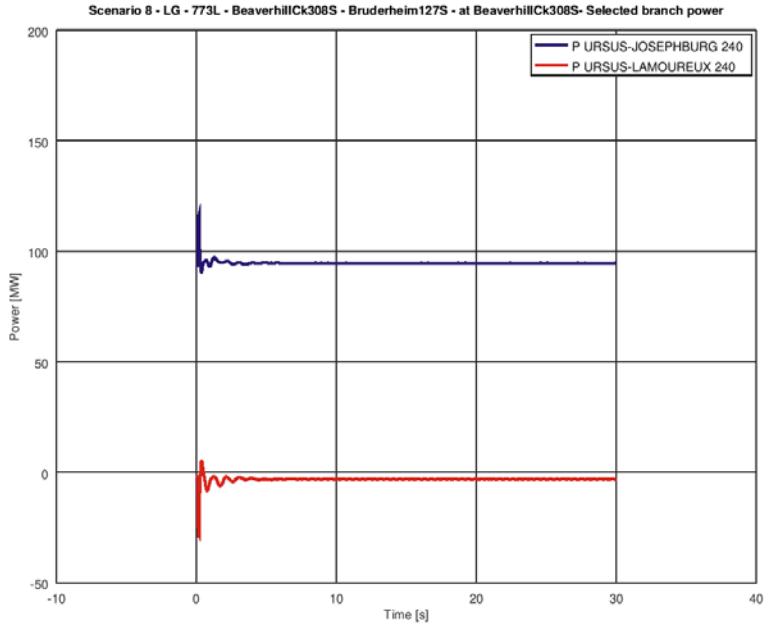


Figure A-1417 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch power

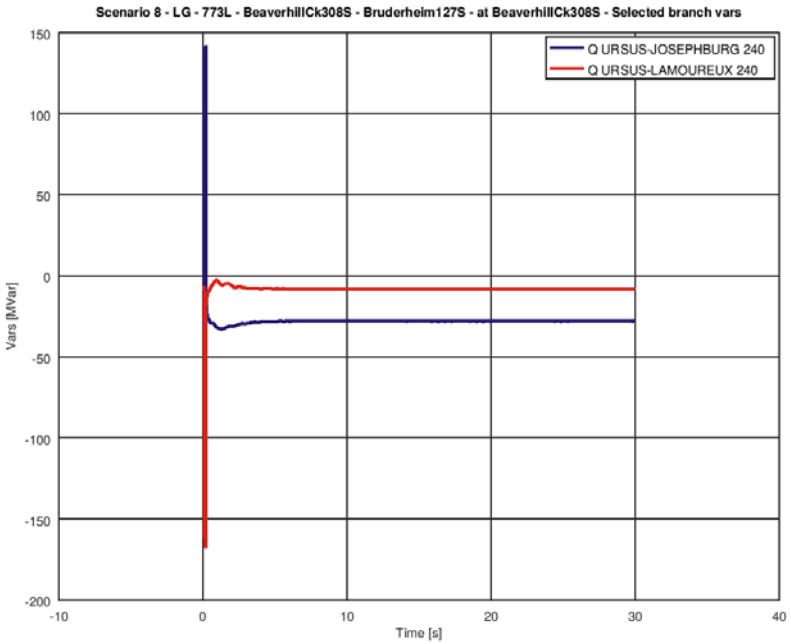


Figure A-1418 Scenario 8 - LG - 773L - BeaverhillCk308S - Bruderheim127S - at BeaverhillCk308S - Selected branch vars

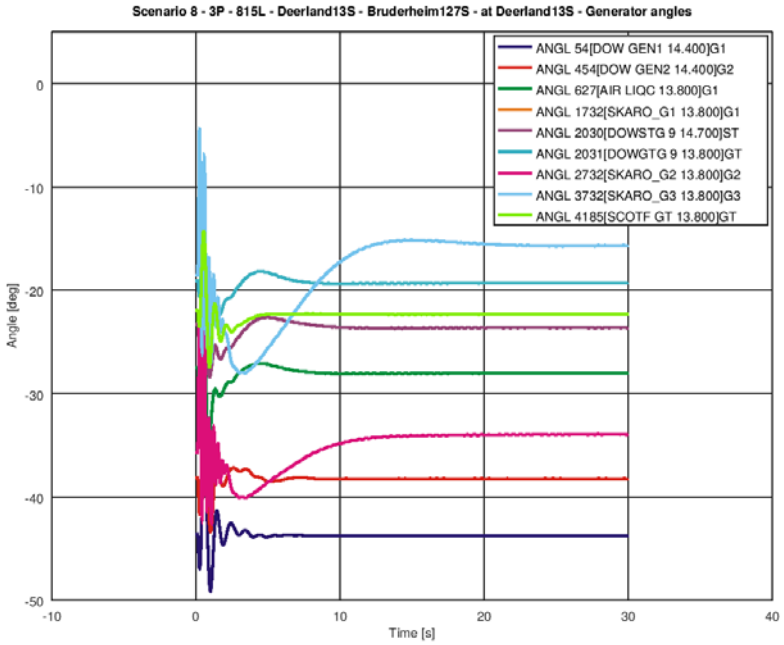


Figure A-1419 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

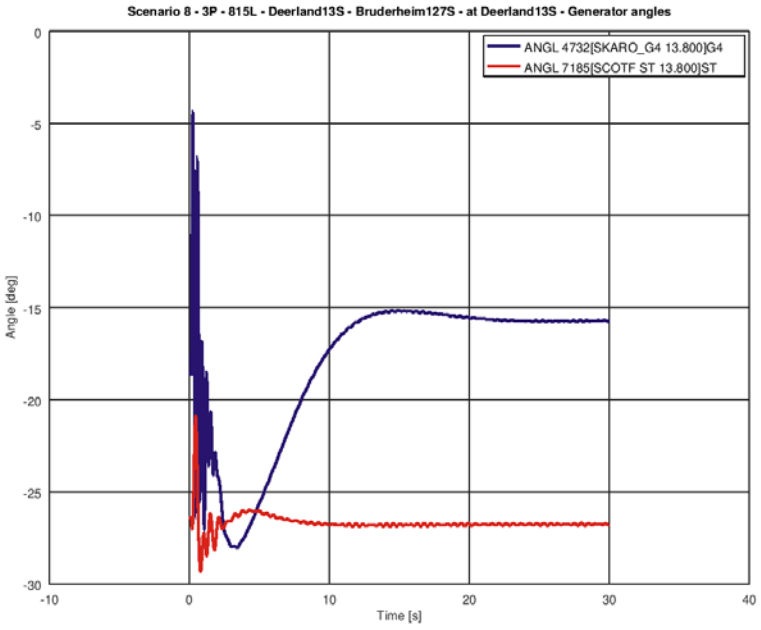


Figure A-1420 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

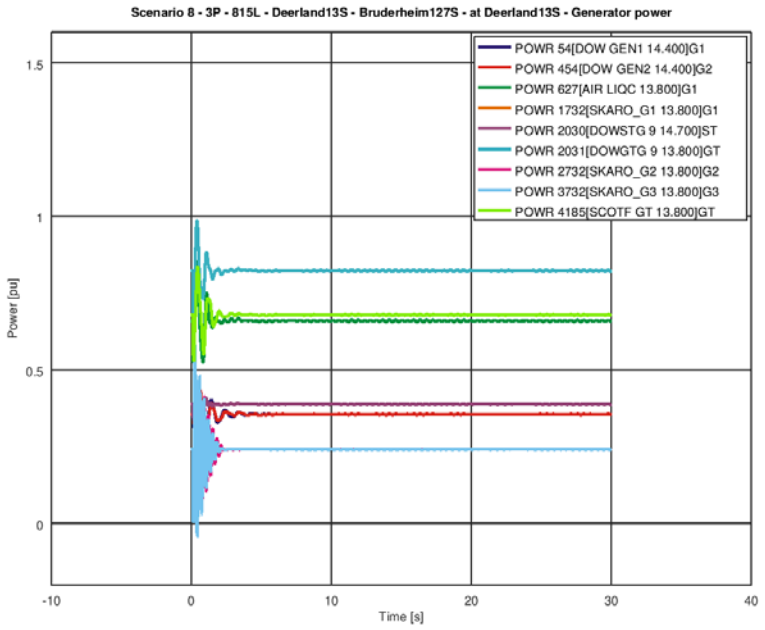


Figure A-1421 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

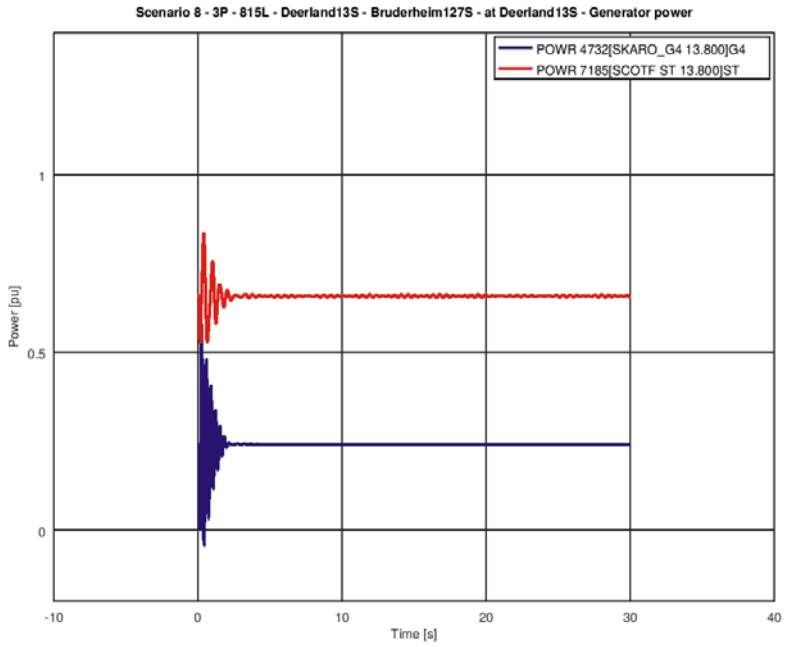


Figure A-1422 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

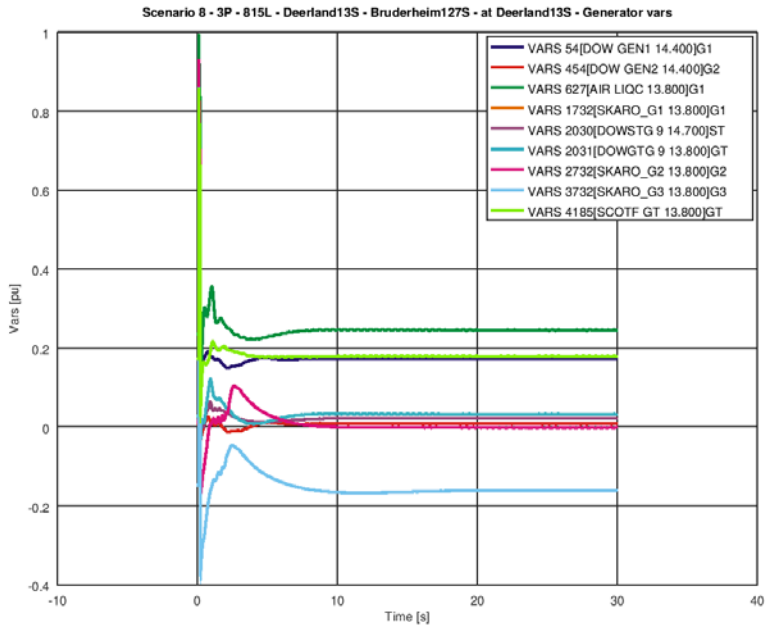


Figure A-1423 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

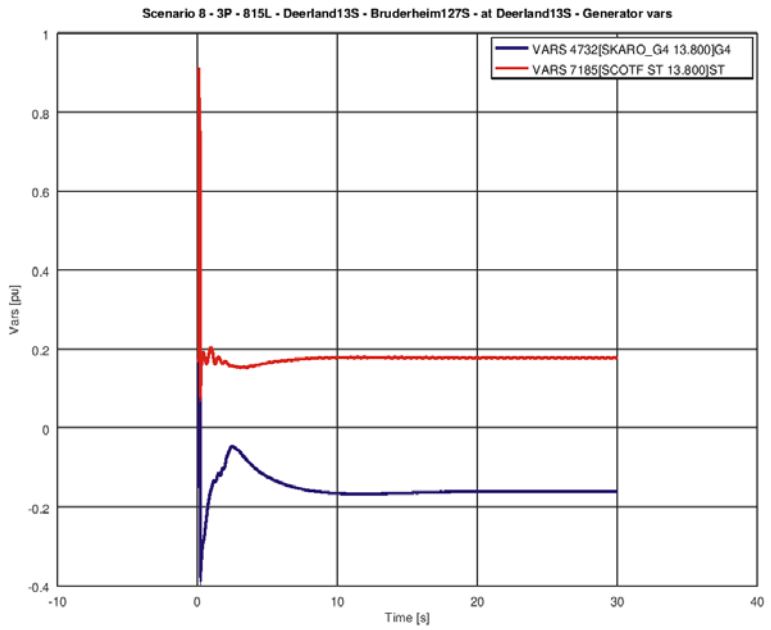


Figure A-1424 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

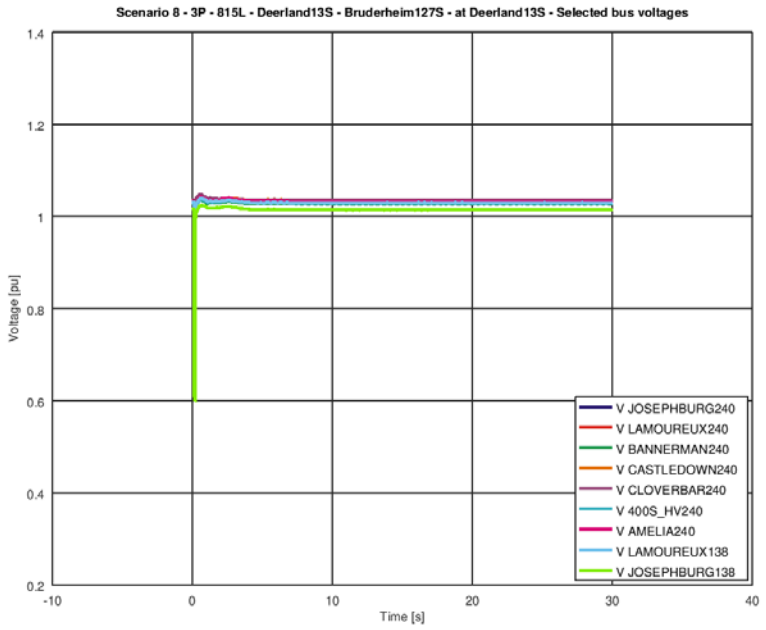


Figure A-1425 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

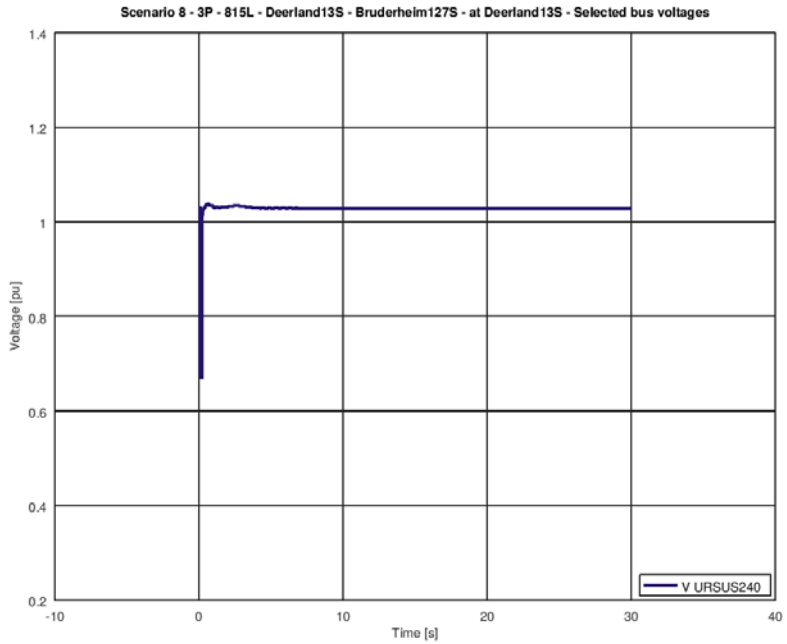


Figure A-1426 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

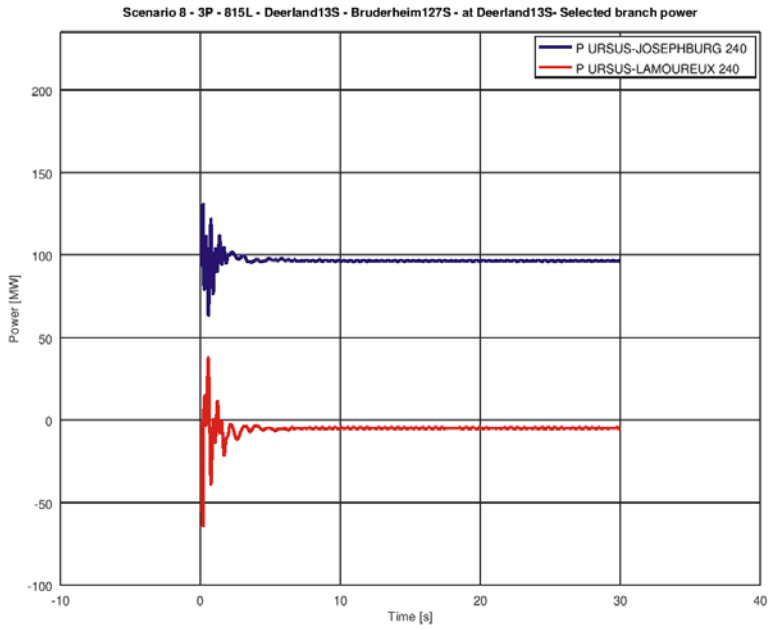


Figure A-1427 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

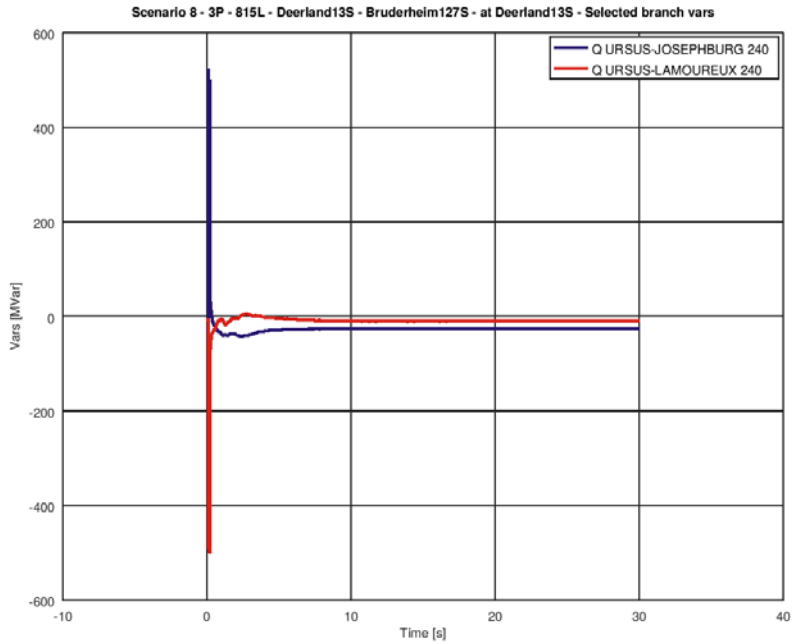


Figure A-1428 Scenario 8 - 3P - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

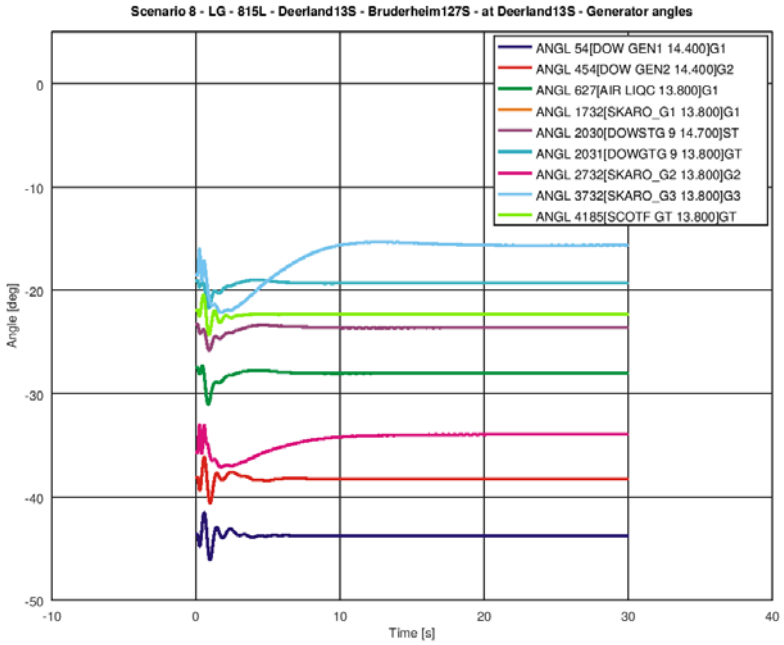


Figure A-1429 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

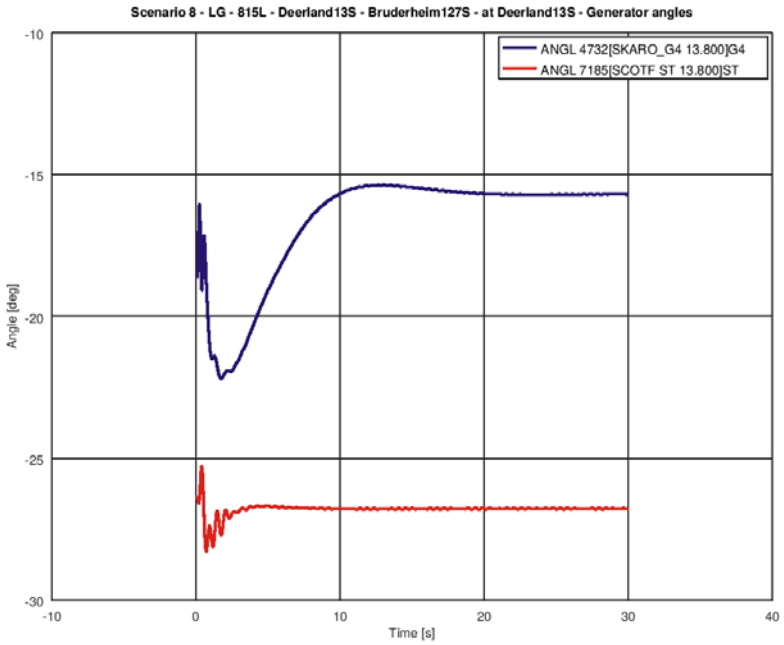


Figure A-1430 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator angles

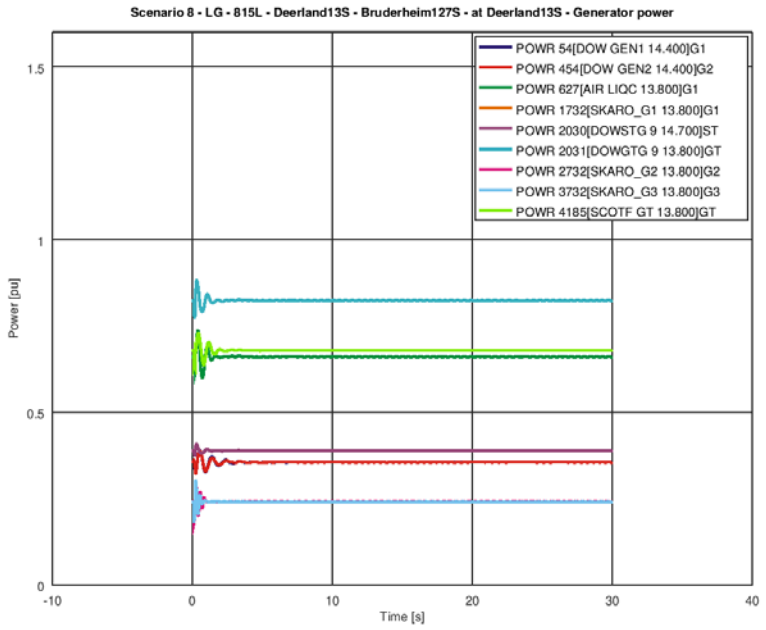


Figure A-1431 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

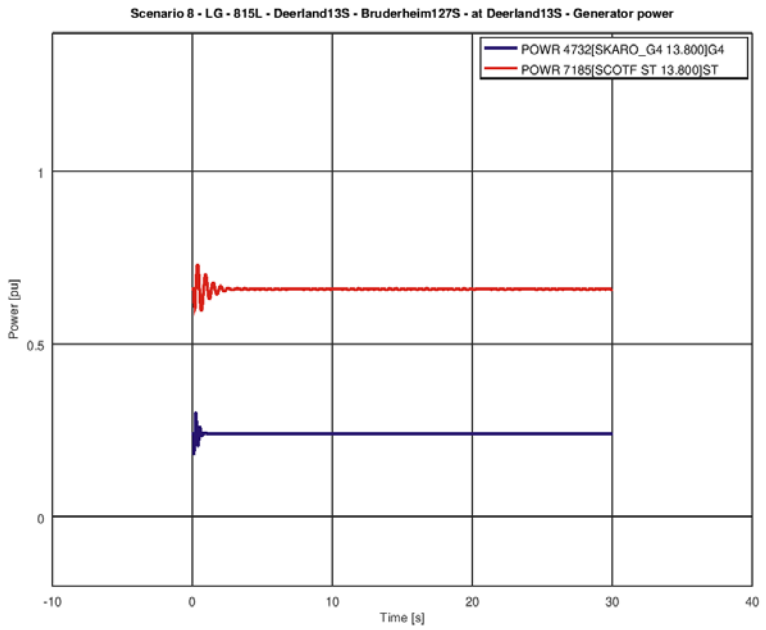


Figure A-1432 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator power

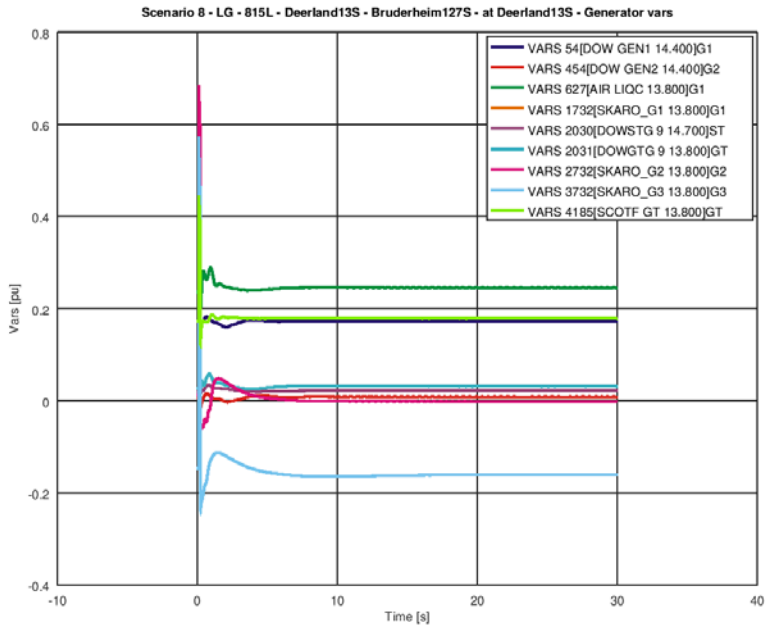


Figure A-1433 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

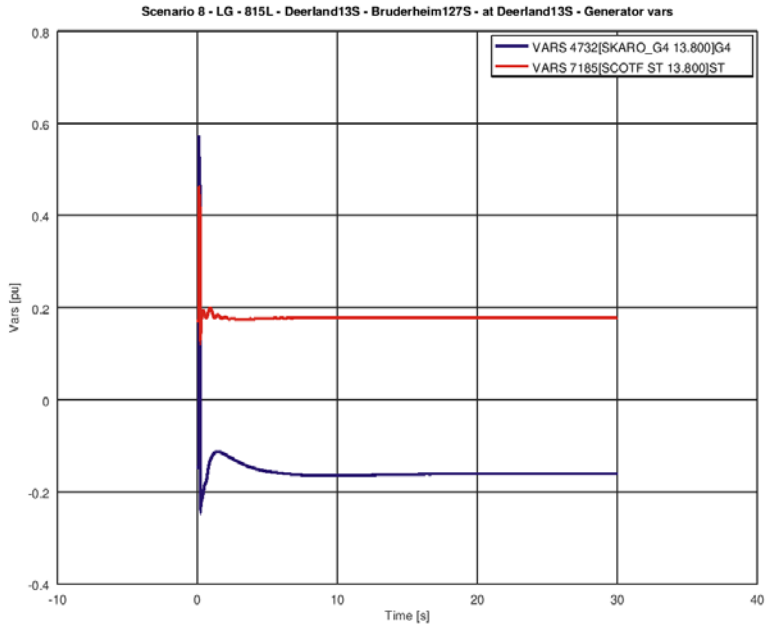


Figure A-1434 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Generator vars

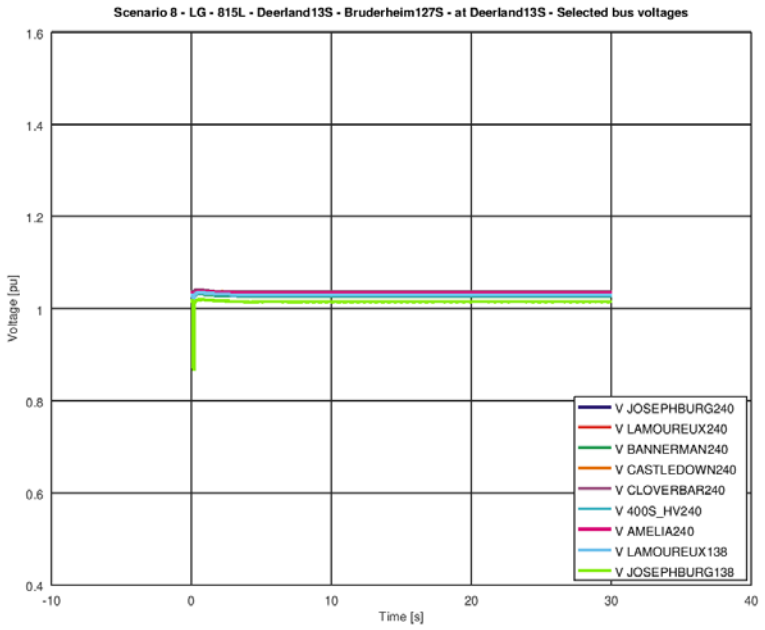


Figure A-1435 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

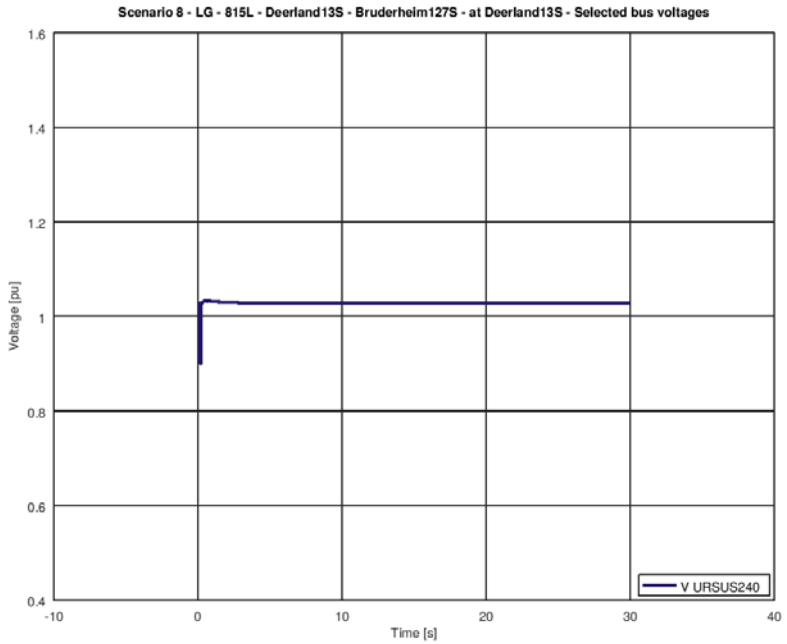


Figure A-1436 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected bus voltages

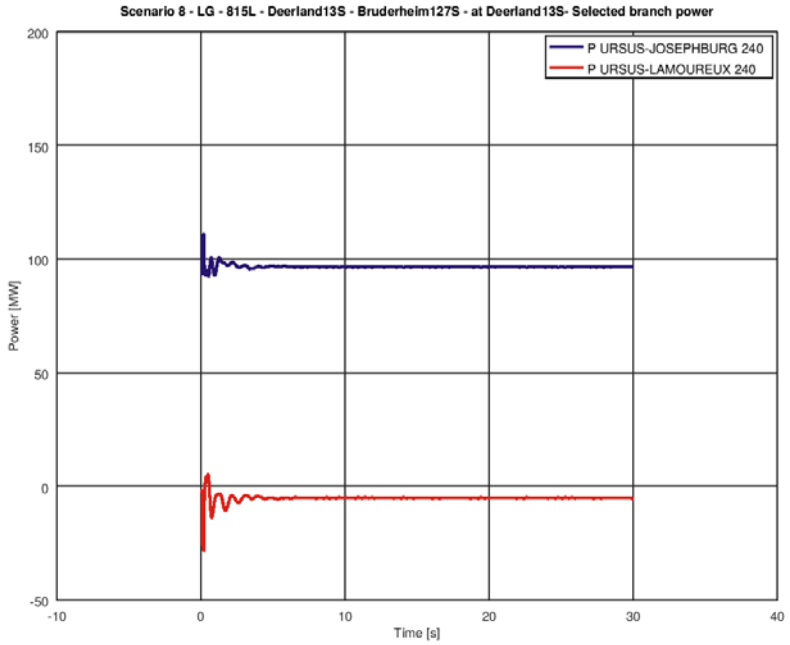


Figure A-1437 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch power

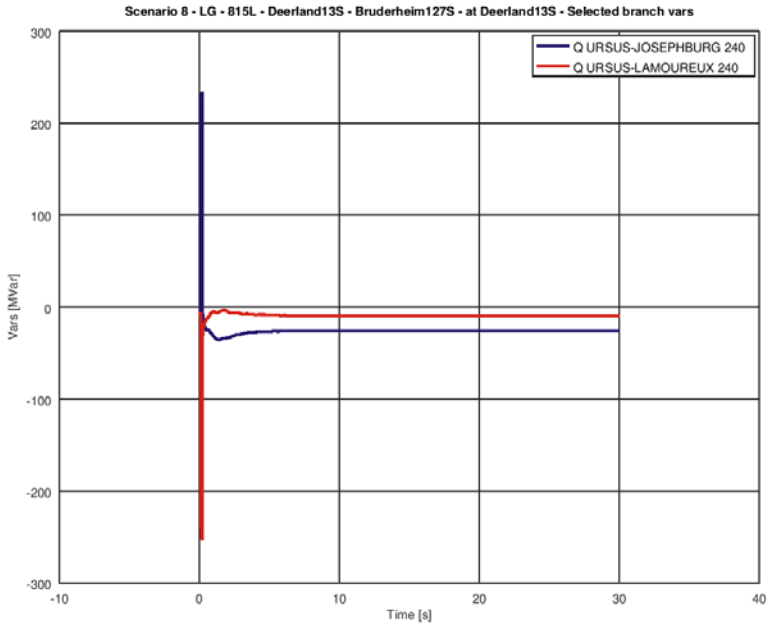


Figure A-1438 Scenario 8 - LG - 815L - Deerland13S - Bruderheim127S - at Deerland13S - Selected branch vars

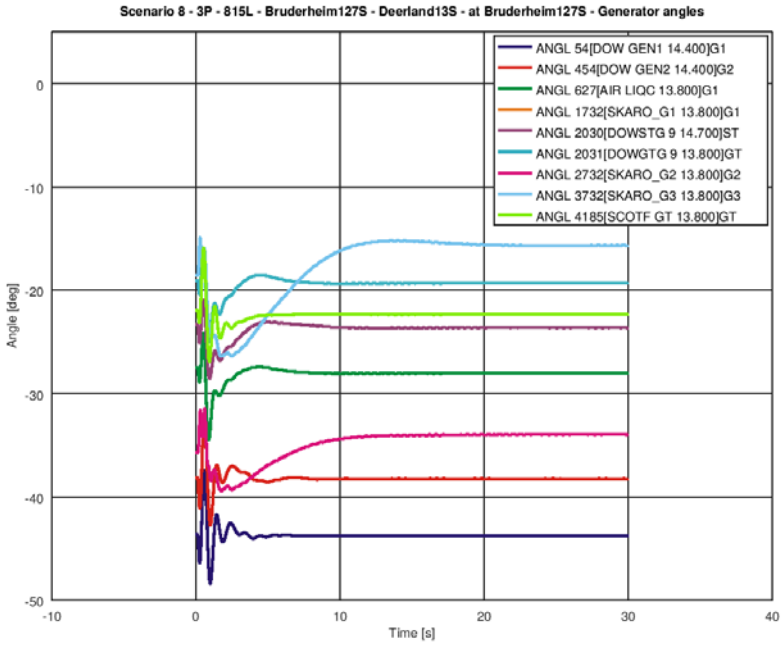


Figure A-1439 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

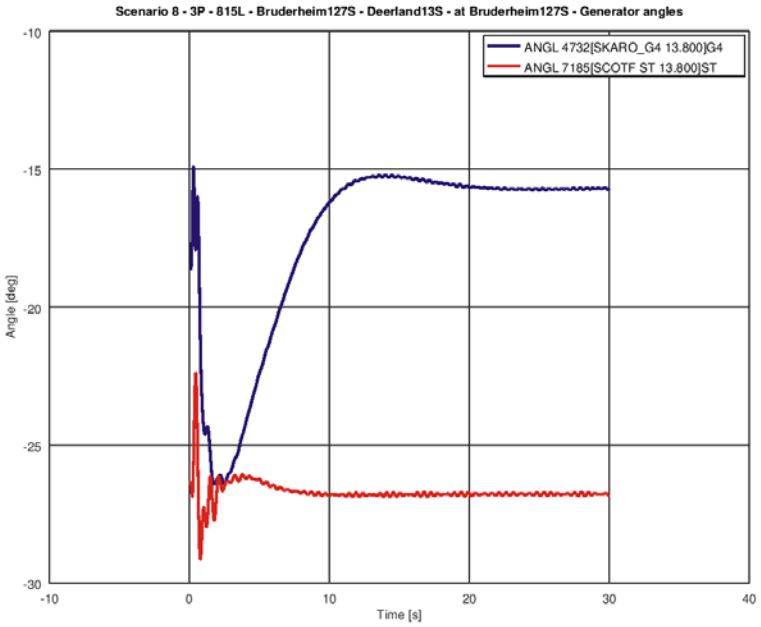


Figure A-1440 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

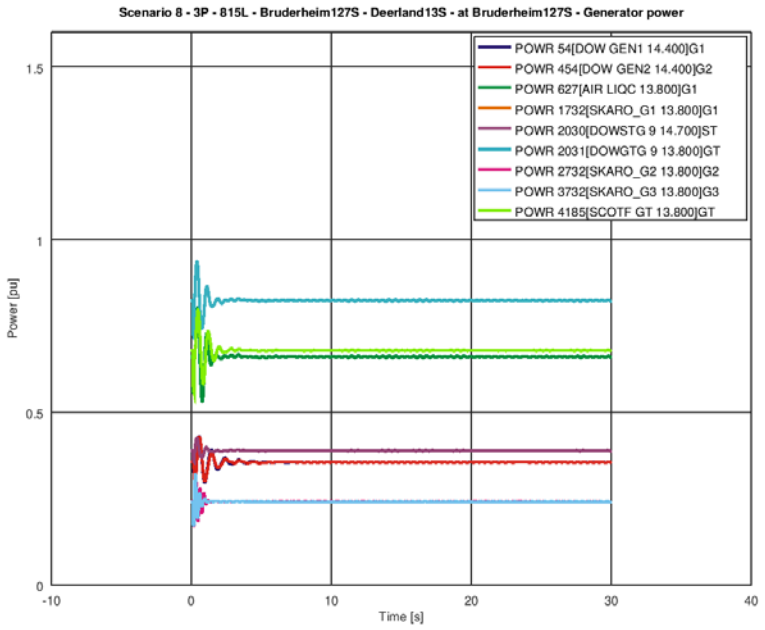


Figure A-1441 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

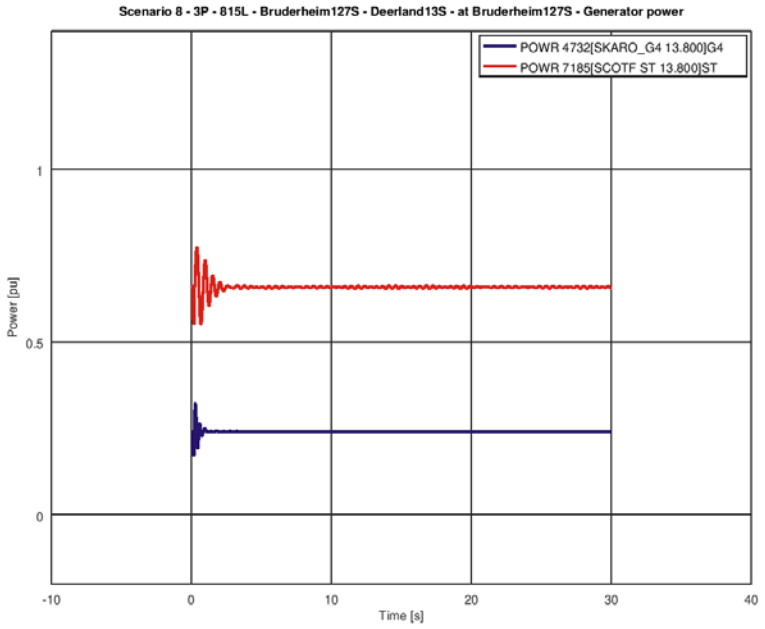


Figure A-1442 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

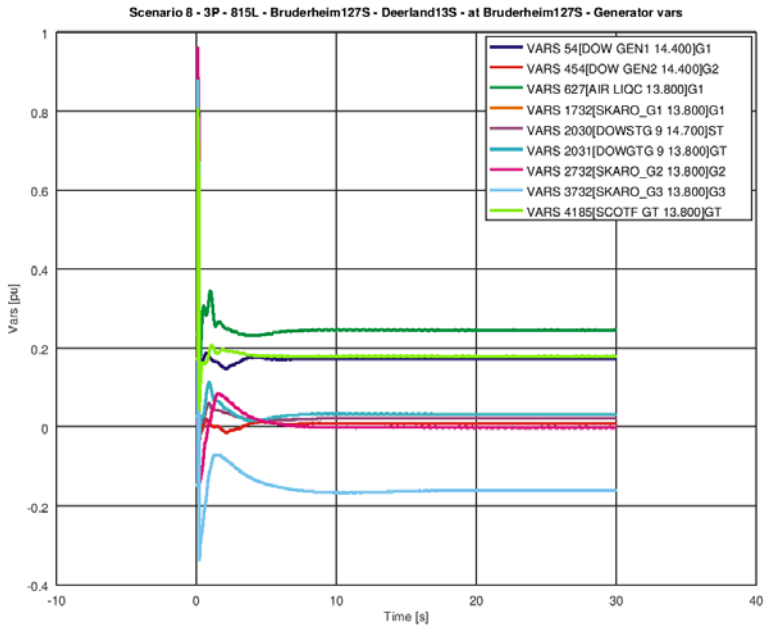


Figure A-1443 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

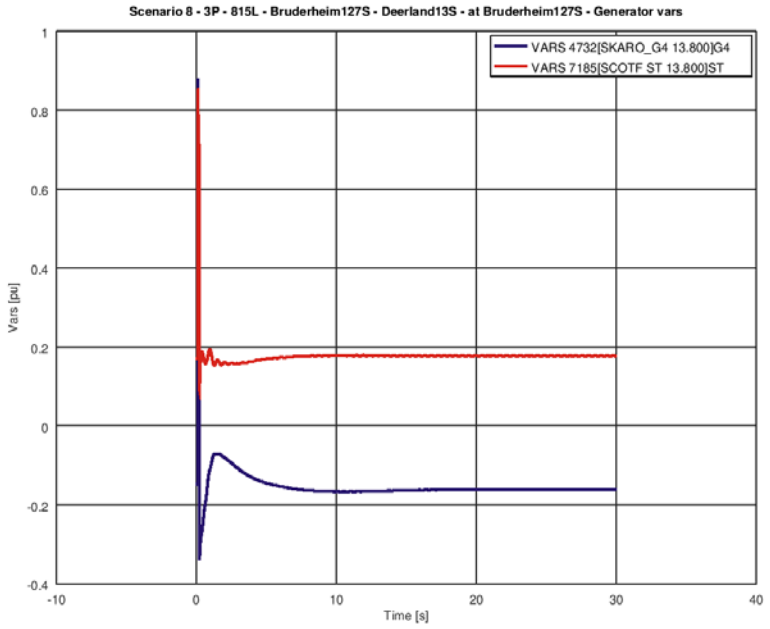


Figure A-1444 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

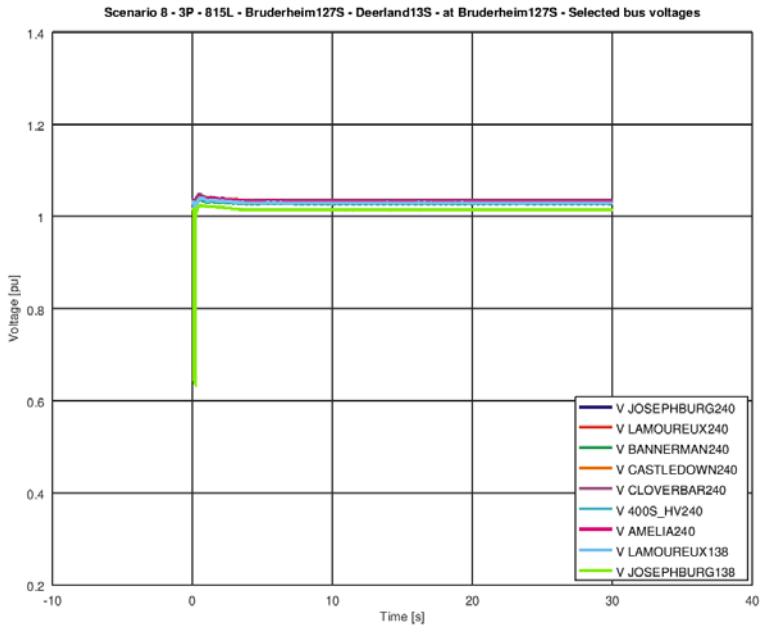


Figure A-1445 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

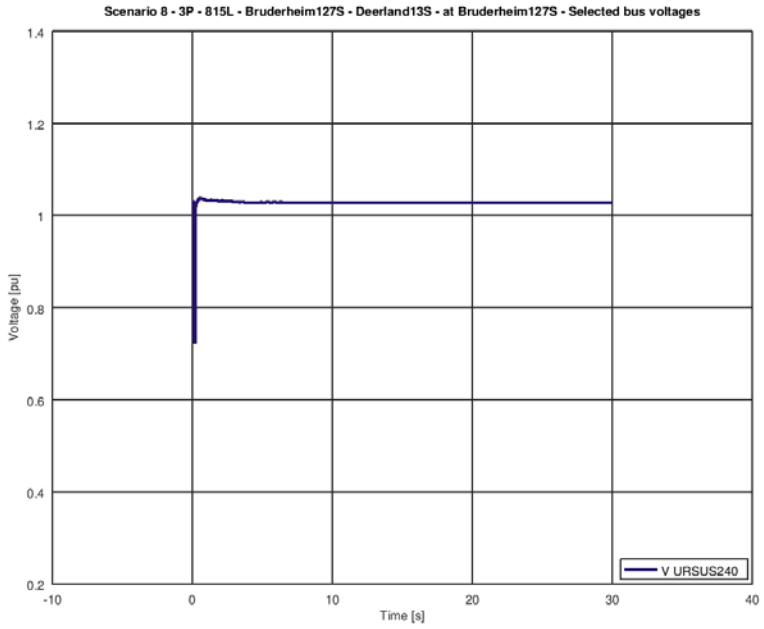


Figure A-1446 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

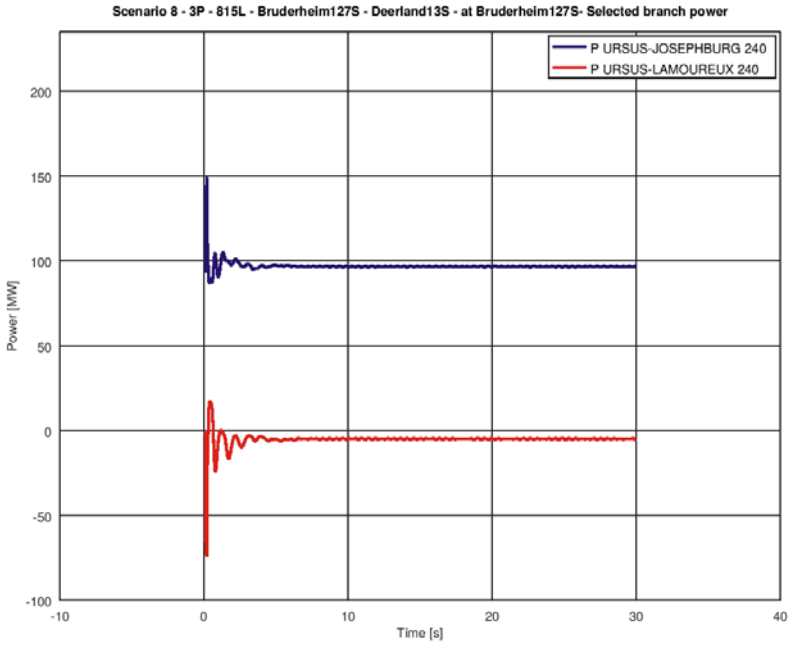


Figure A-1447 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

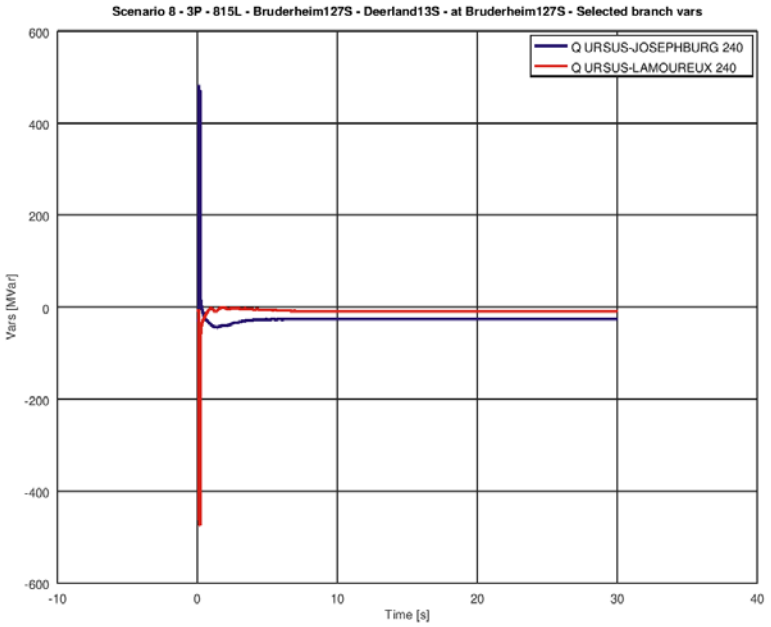


Figure A-1448 Scenario 8 - 3P - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

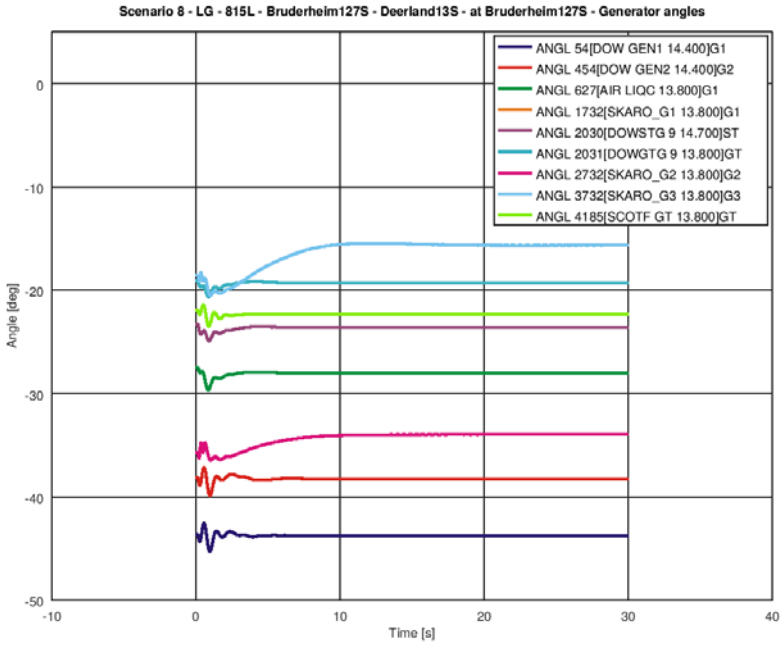


Figure A-1449 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

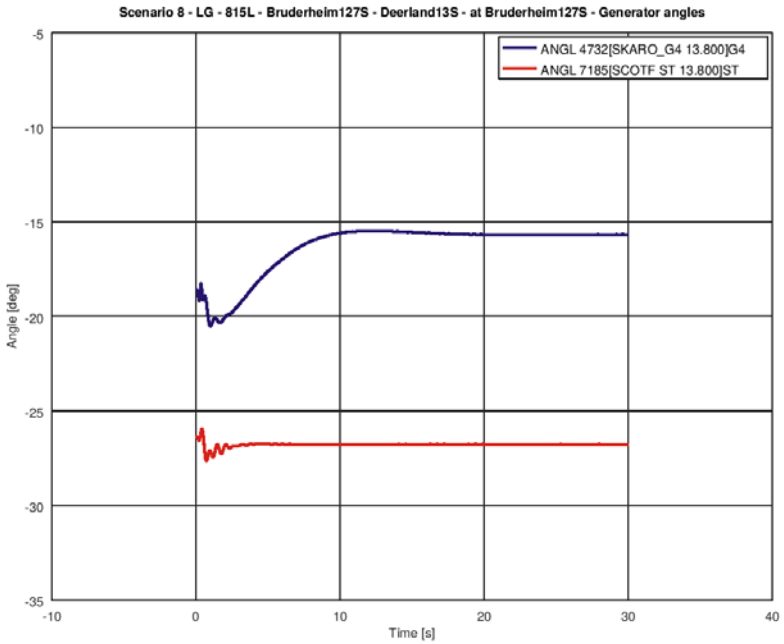


Figure A-1450 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator angles

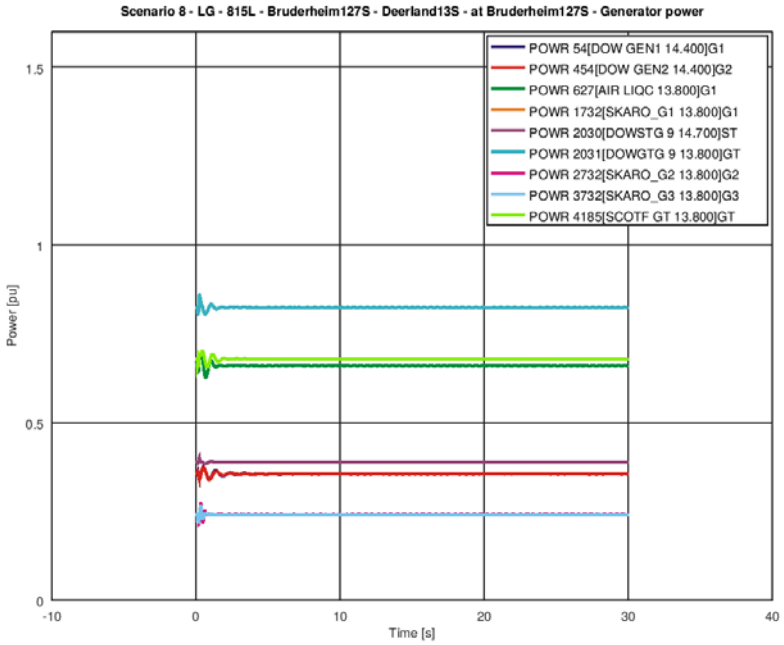


Figure A-1451 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

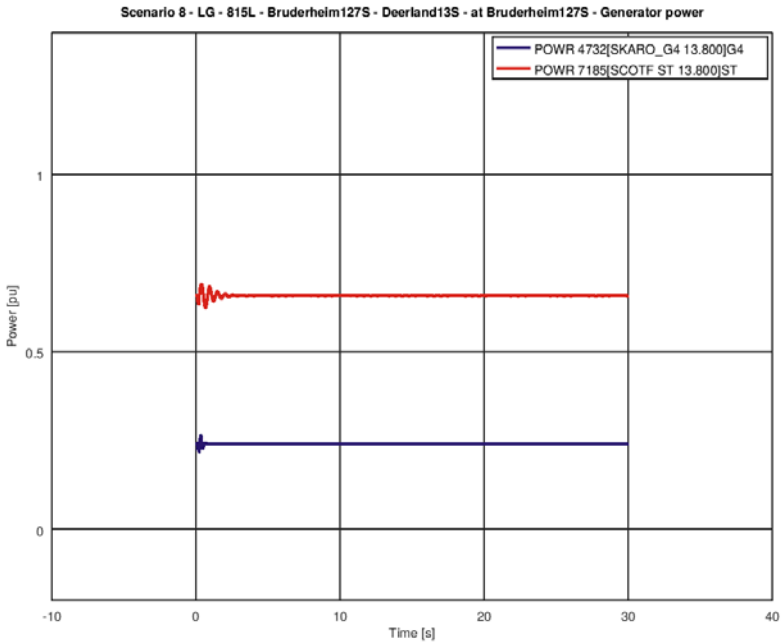


Figure A-1452 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator power

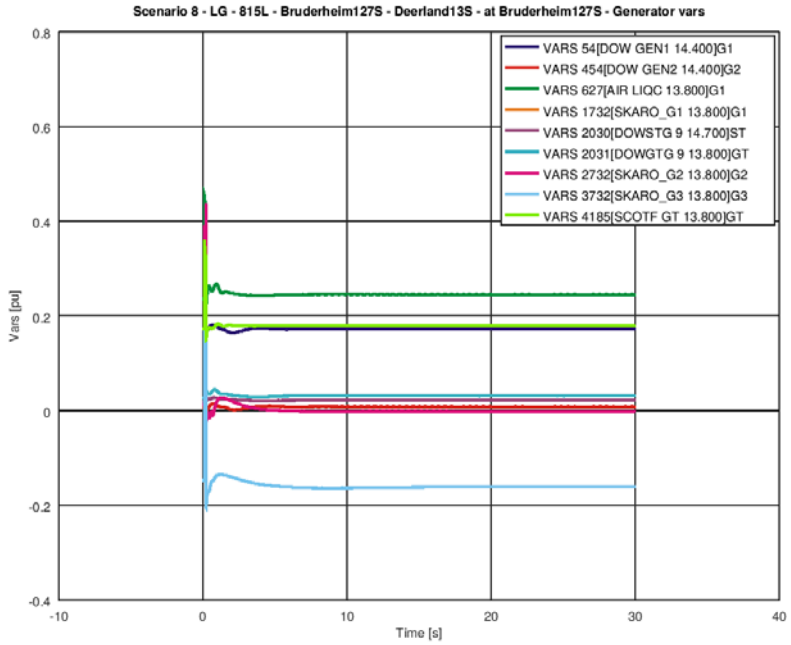


Figure A-1453 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

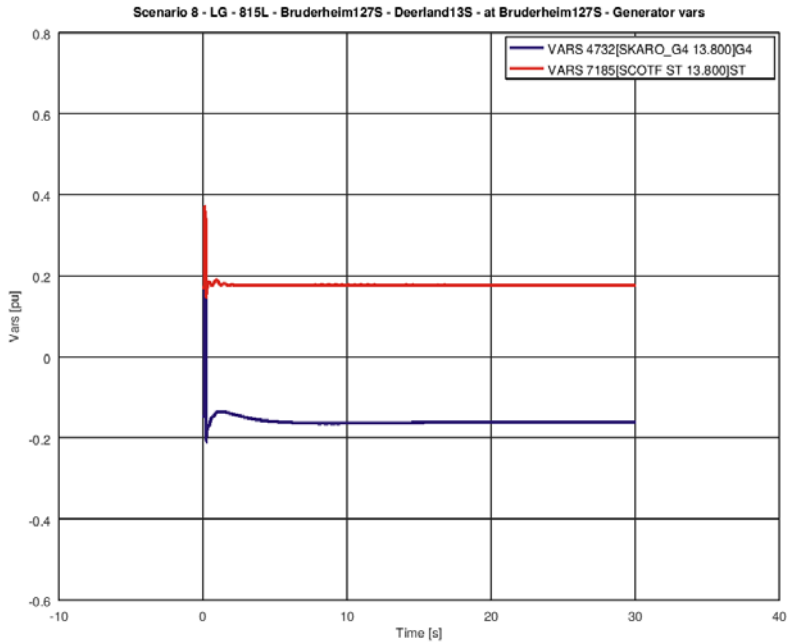


Figure A-1454 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Generator vars

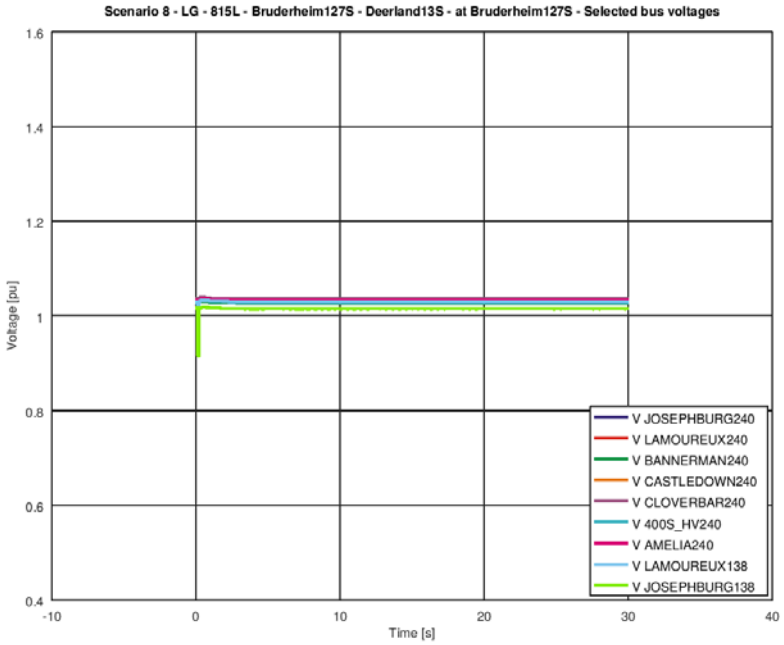


Figure A-1455 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

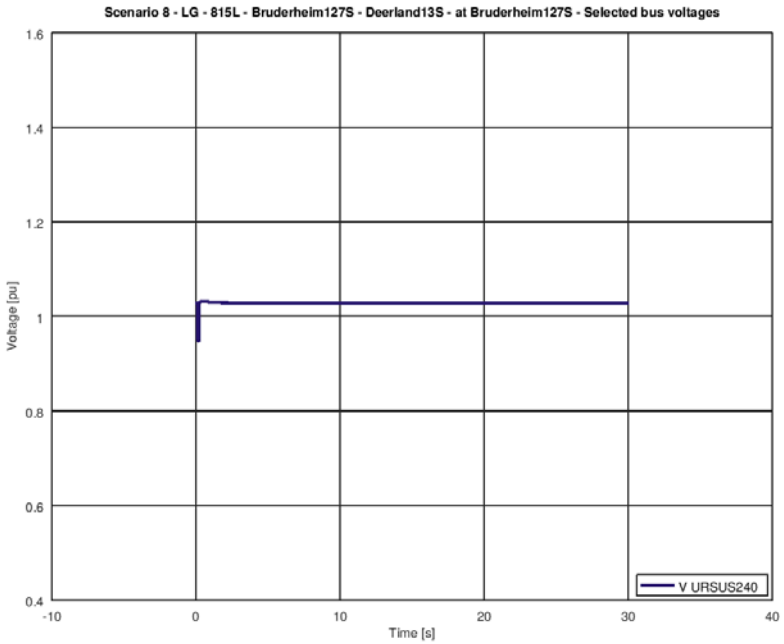


Figure A-1456 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected bus voltages

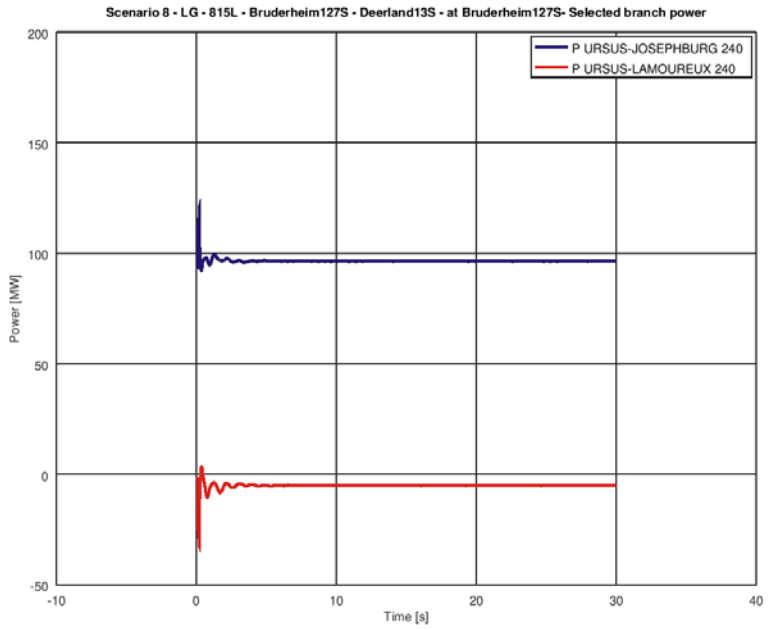


Figure A-1457 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch power

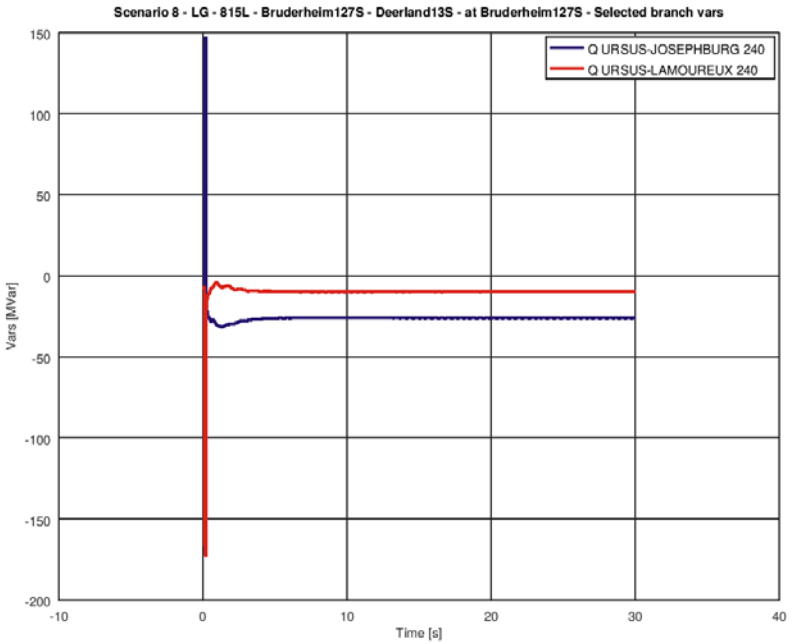


Figure A-1458 Scenario 8 - LG - 815L - Bruderheim127S - Deerland13S - at Bruderheim127S - Selected branch vars

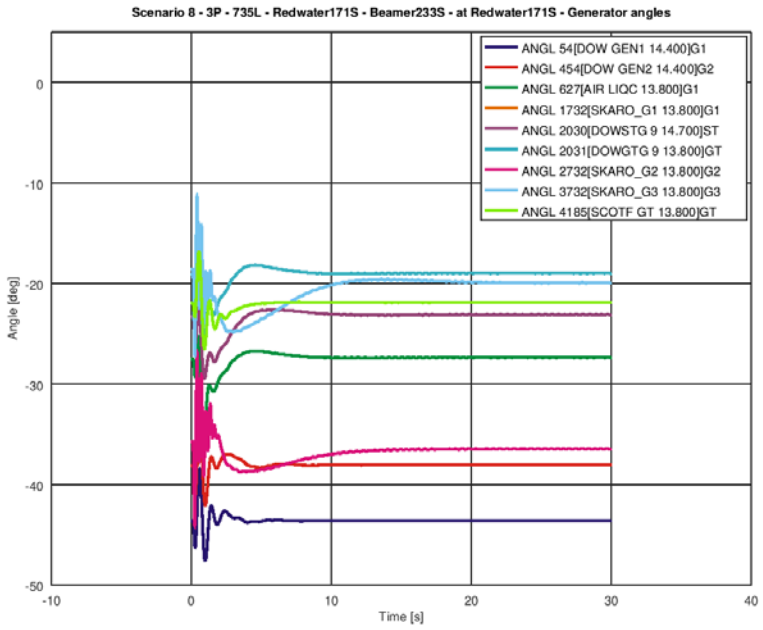


Figure A-1459 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

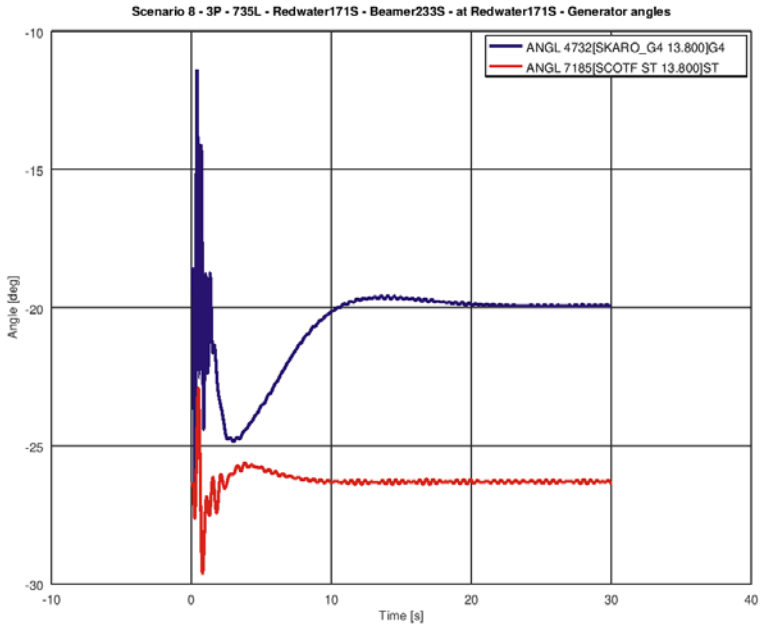


Figure A-1460 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

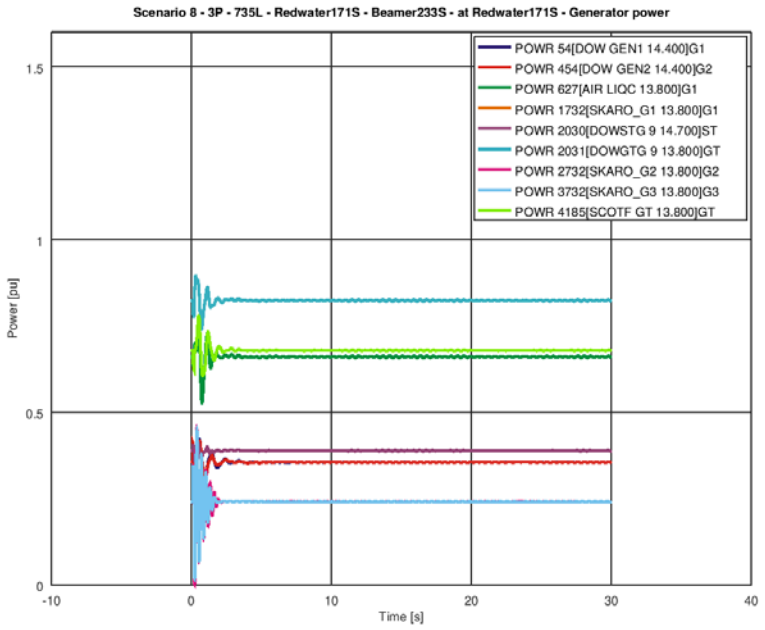


Figure A-1461 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

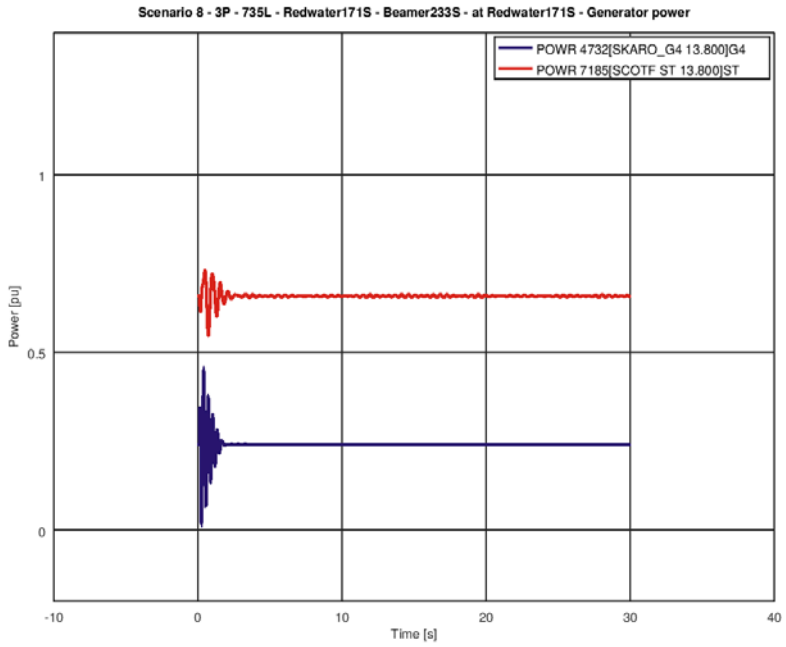


Figure A-1462 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

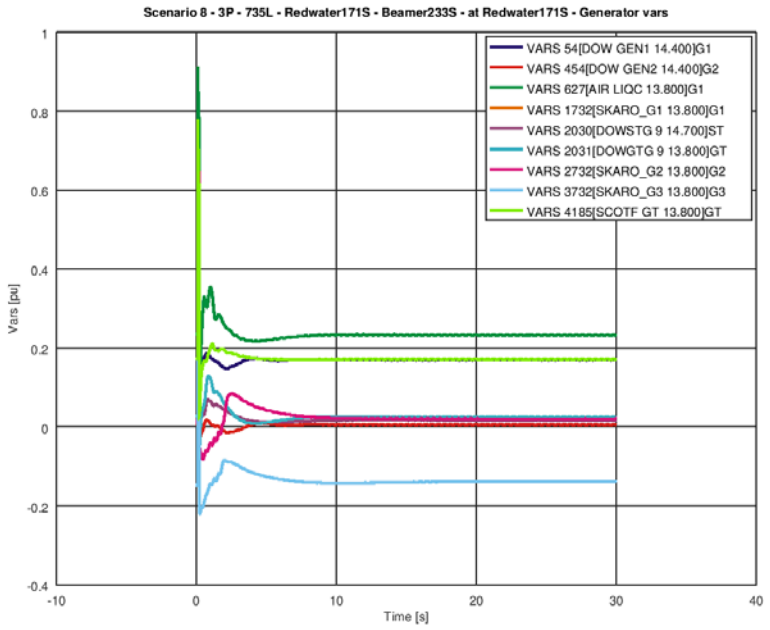


Figure A-1463 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

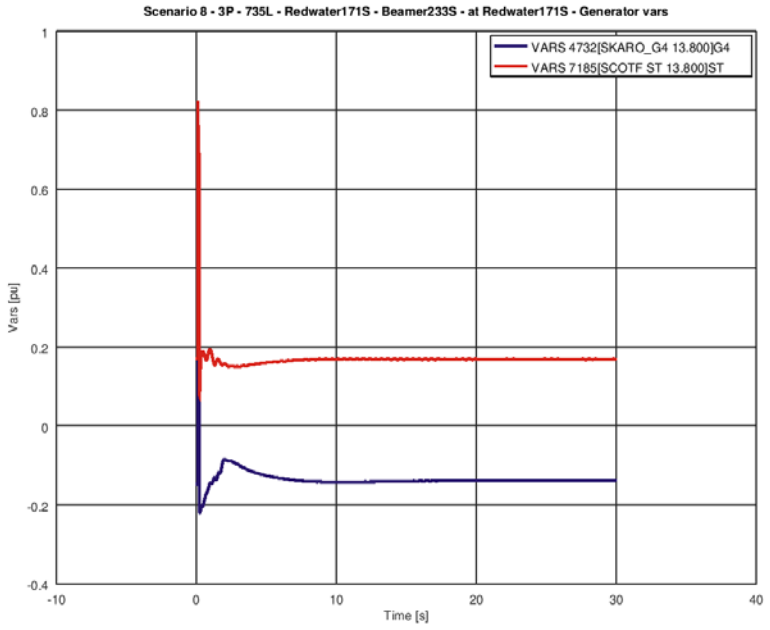


Figure A-1464 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

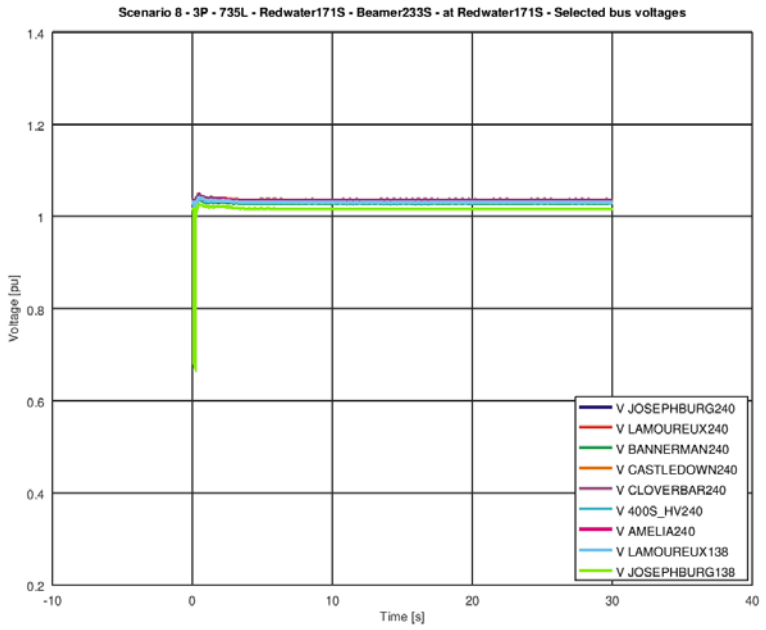


Figure A-1465 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

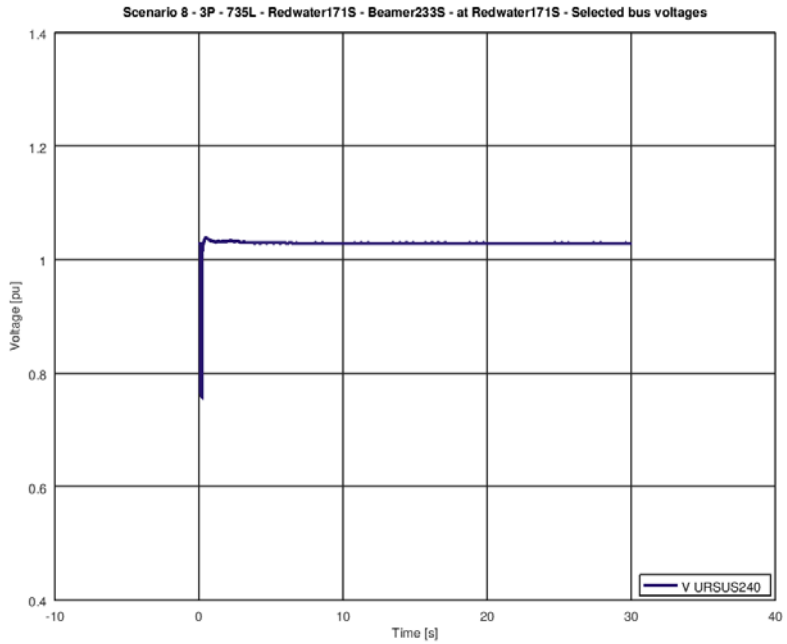


Figure A-1466 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

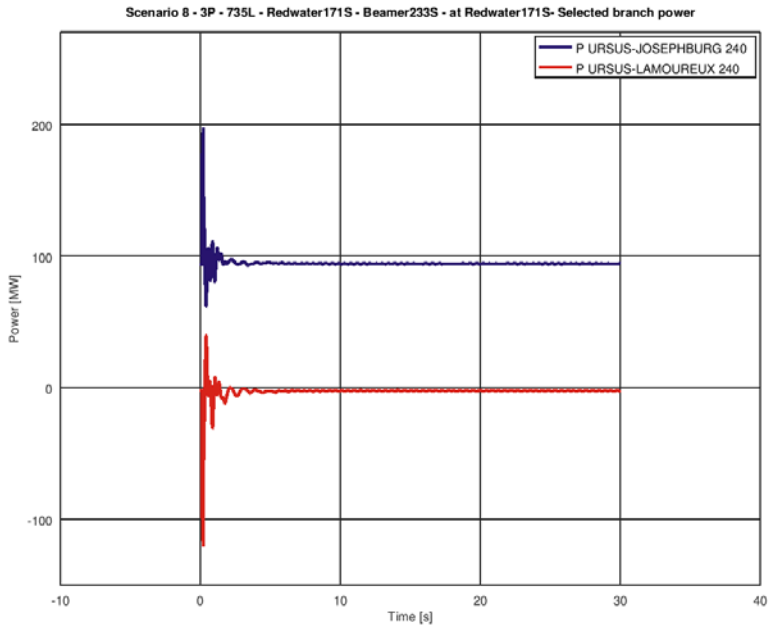


Figure A-1467 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

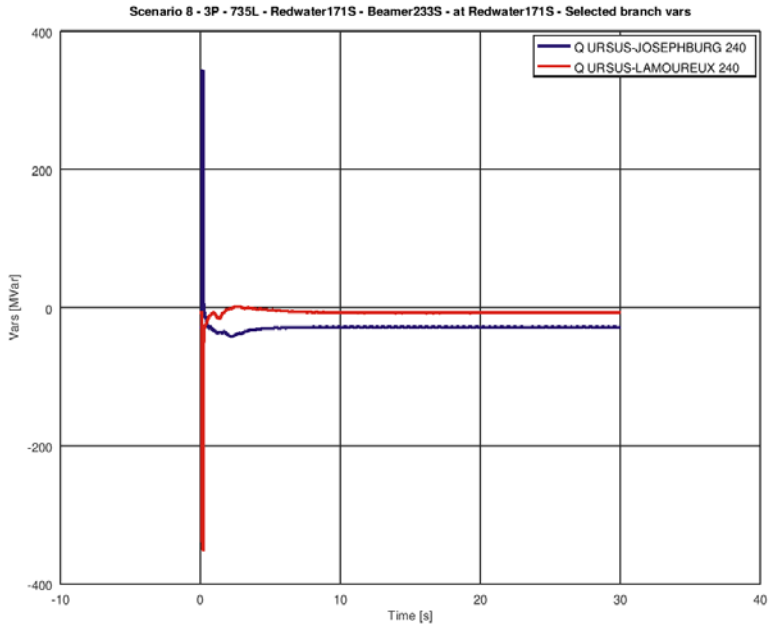


Figure A-1468 Scenario 8 - 3P - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

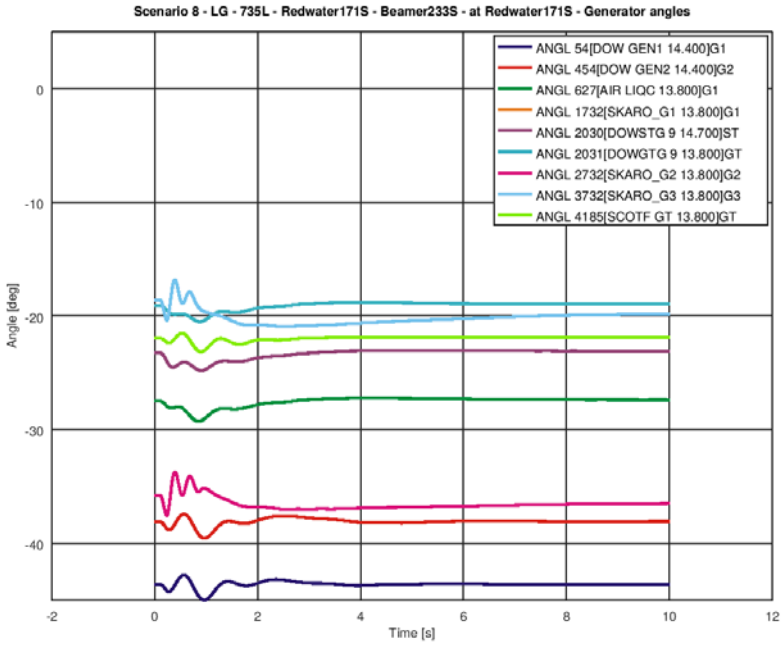


Figure A-1469 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

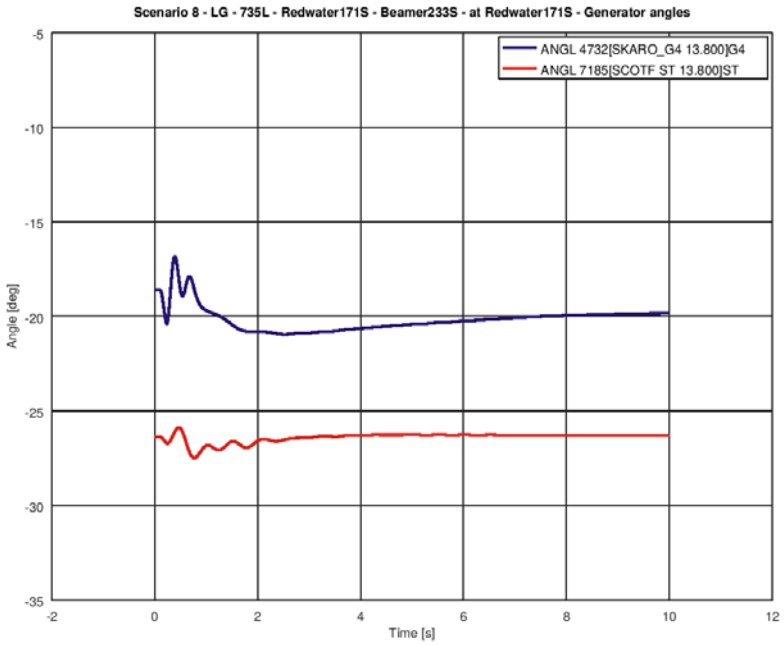


Figure A-1470 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator angles

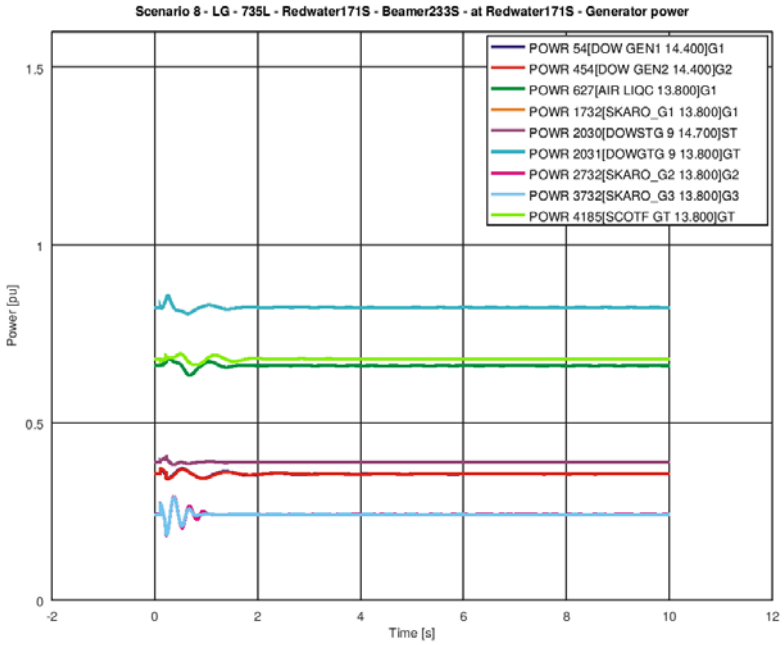


Figure A-1471 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

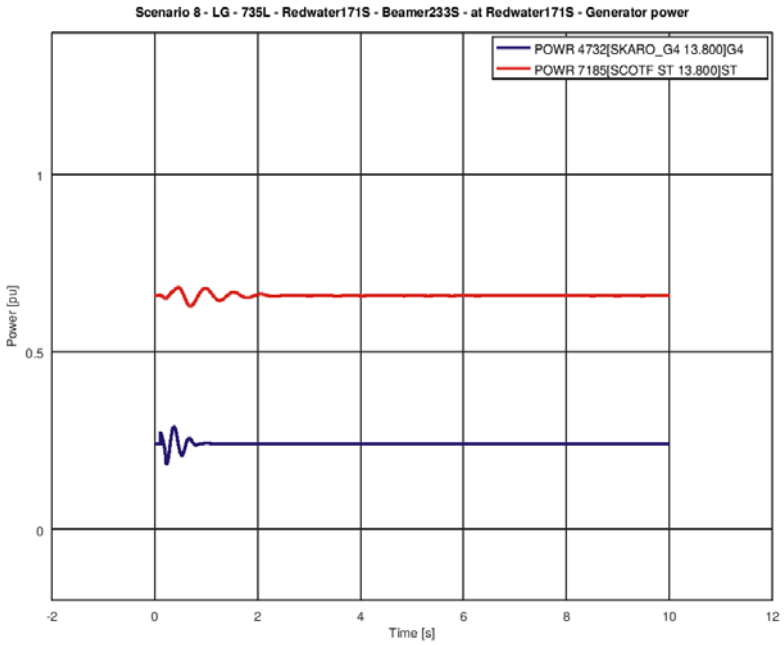


Figure A-1472 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator power

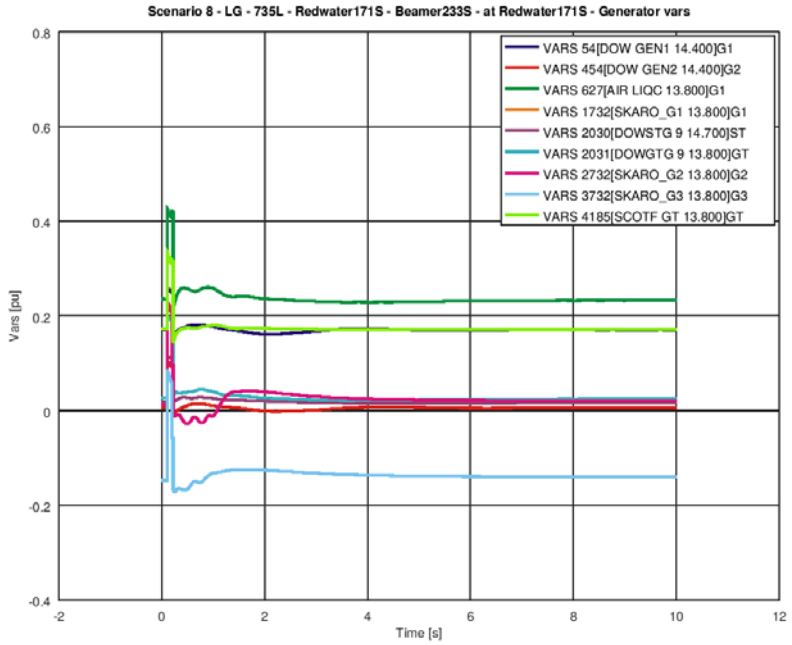


Figure A-1473 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

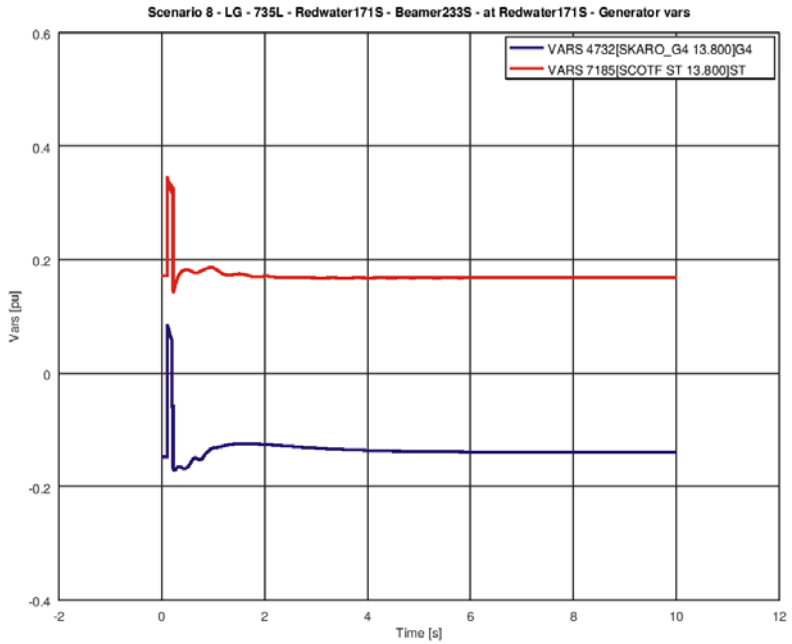


Figure A-1474 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Generator vars

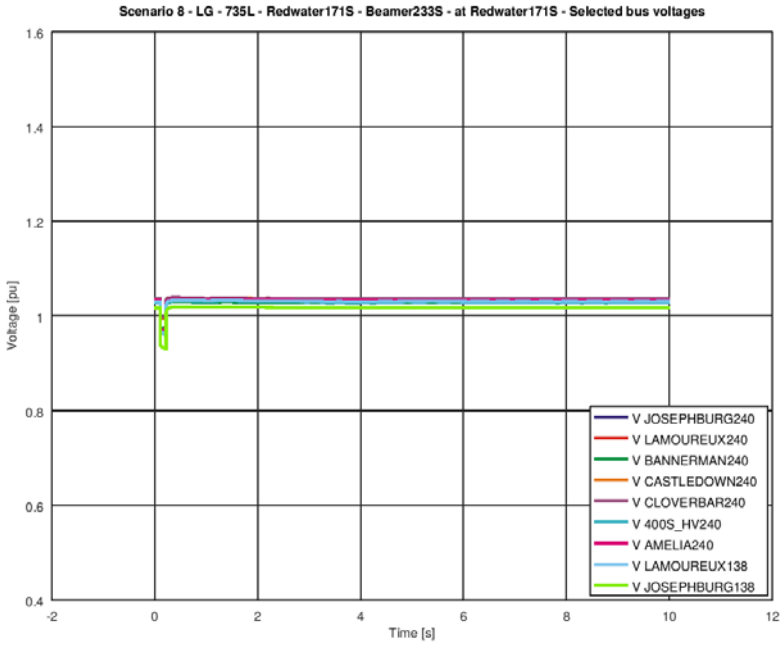


Figure A-1475 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

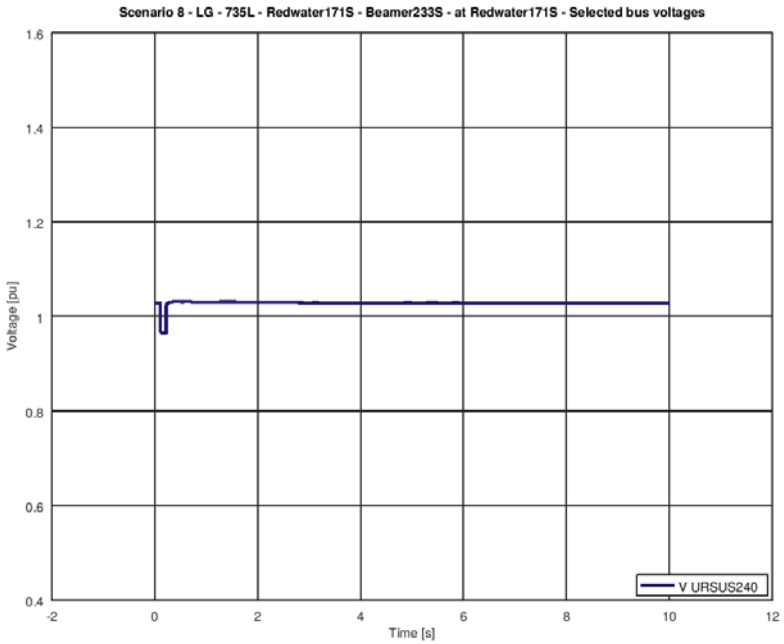


Figure A-1476 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected bus voltages

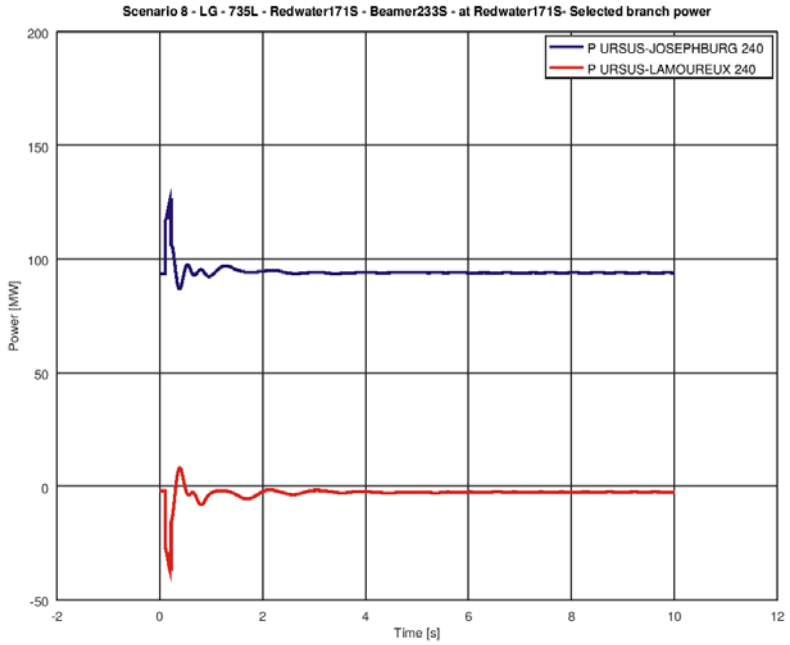


Figure A-1477 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch power

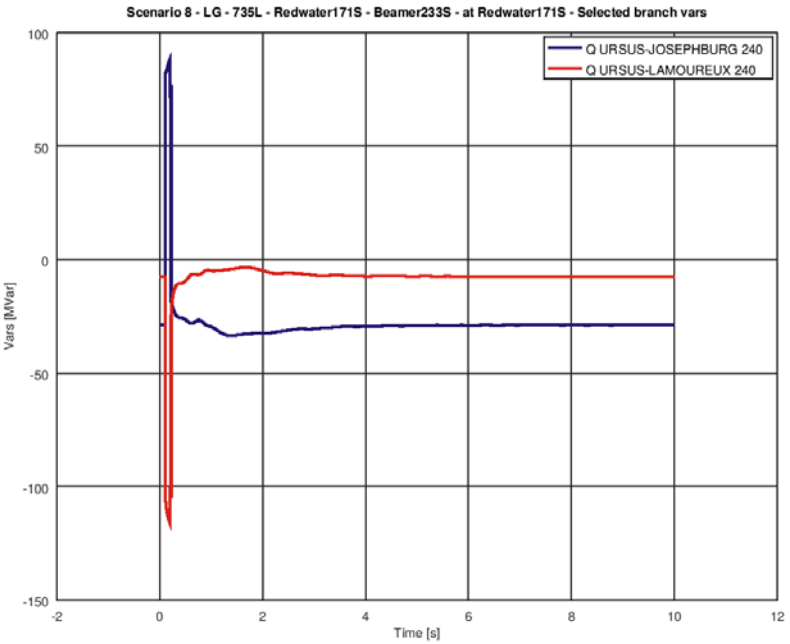


Figure A-1478 Scenario 8 - LG - 735L - Redwater171S - Beamer233S - at Redwater171S - Selected branch vars

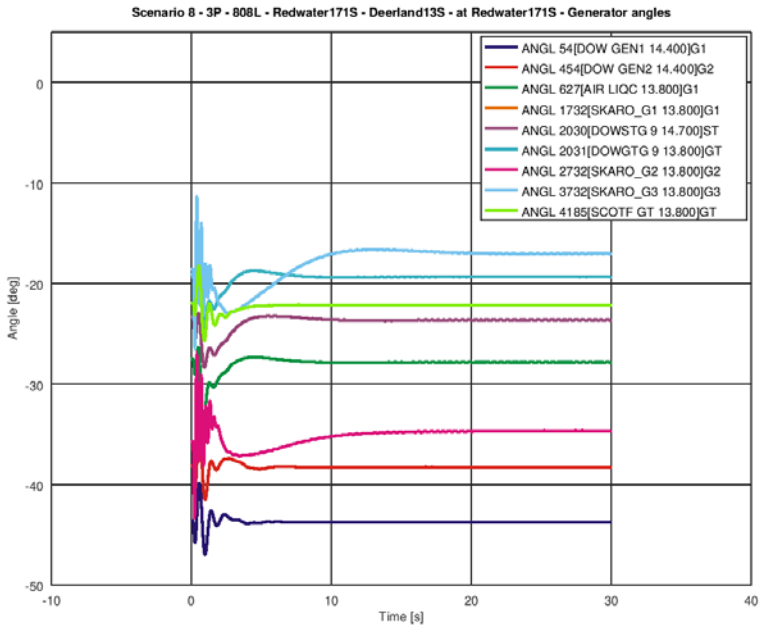


Figure A-1479 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

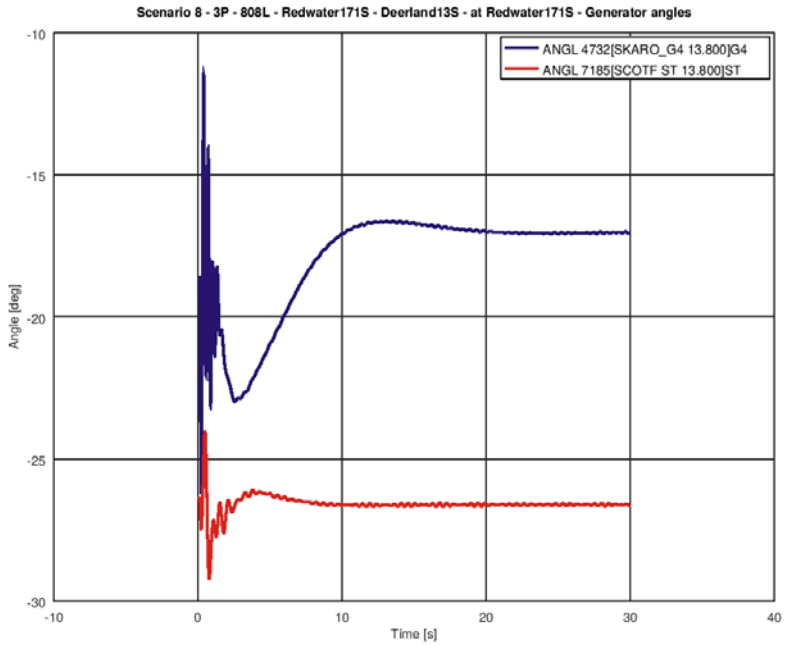


Figure A-1480 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

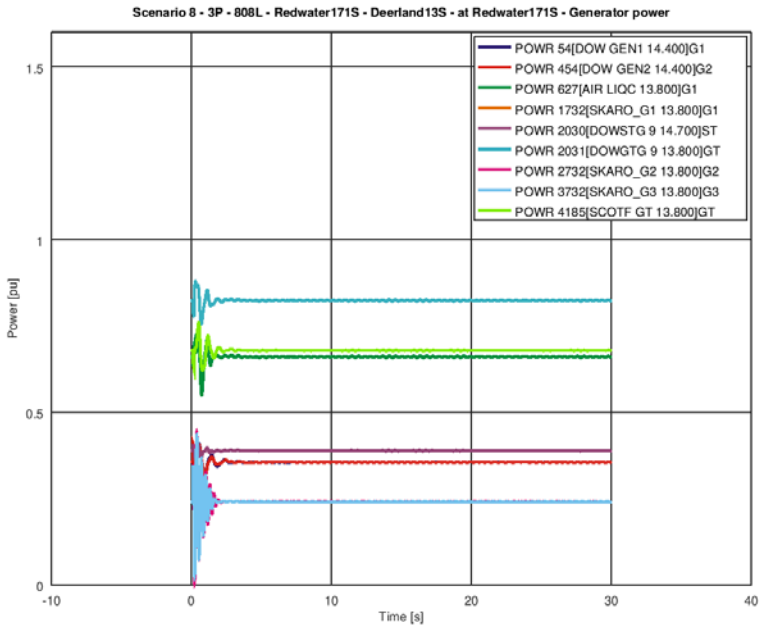


Figure A-1481 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

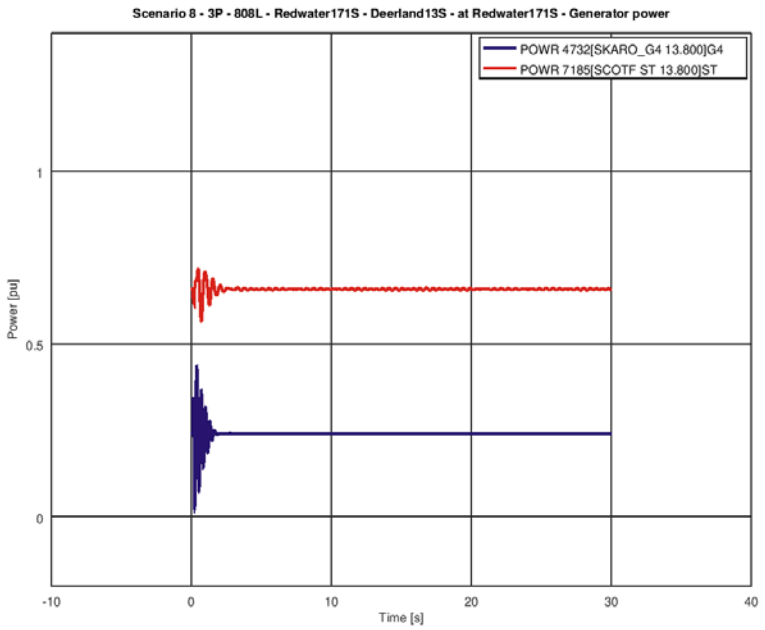


Figure A-1482 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

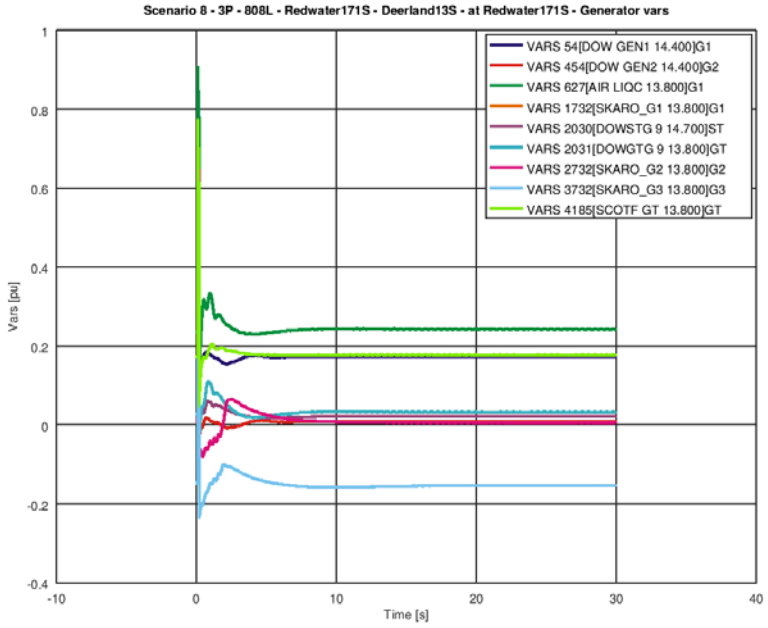


Figure A-1483 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

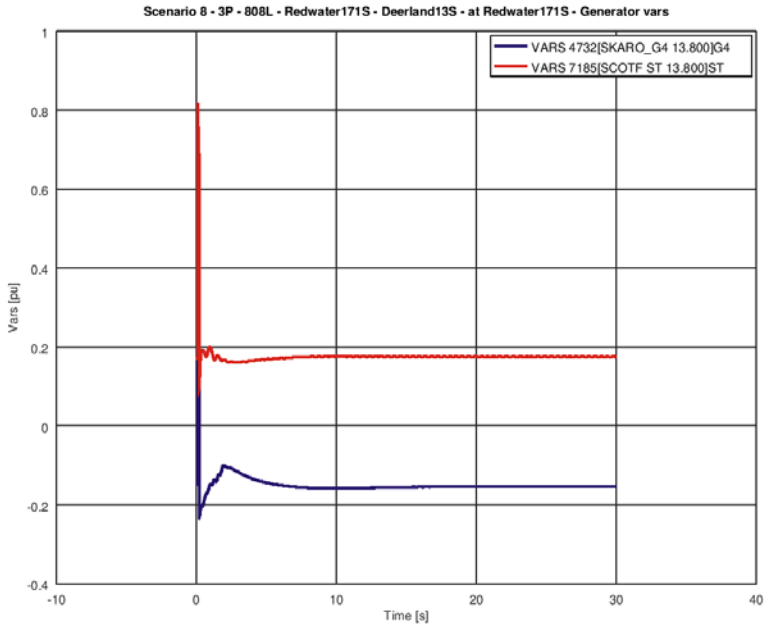


Figure A-1484 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

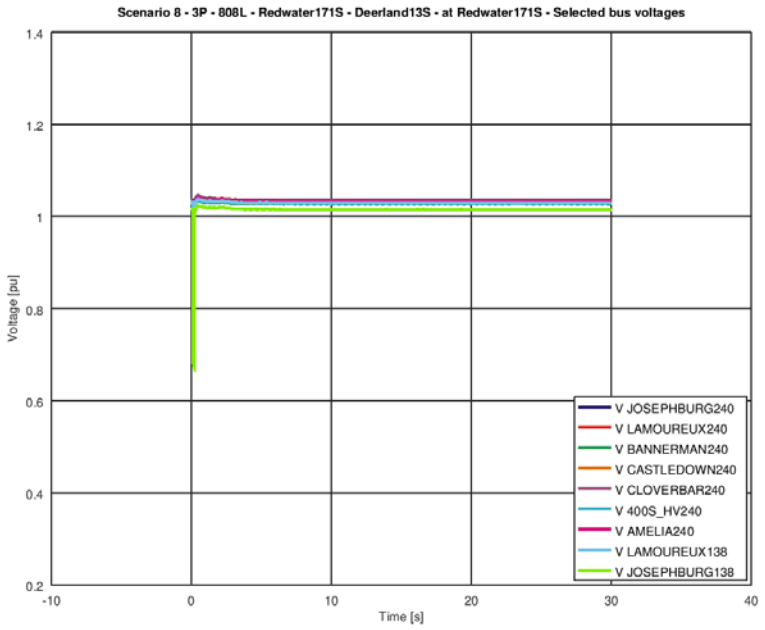


Figure A-1485 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

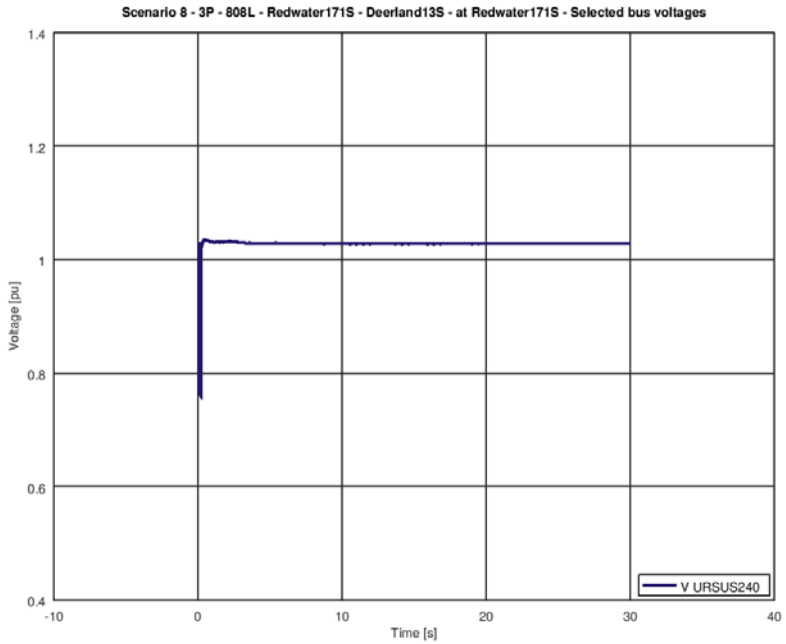


Figure A-1486 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

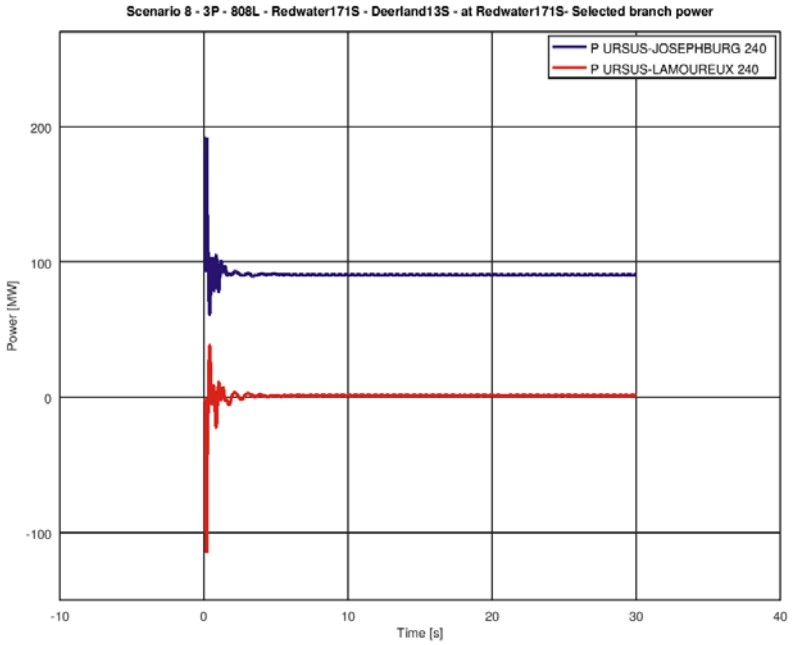


Figure A-1487 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

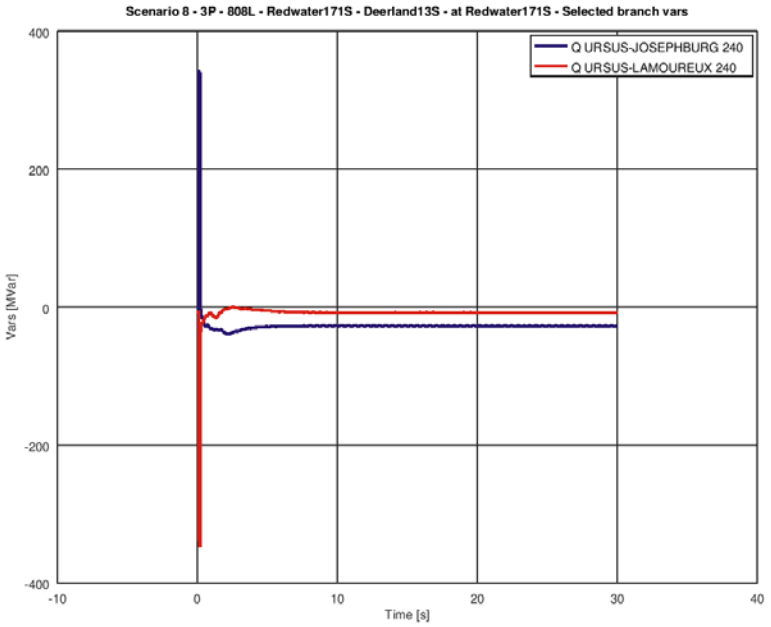


Figure A-1488 Scenario 8 - 3P - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

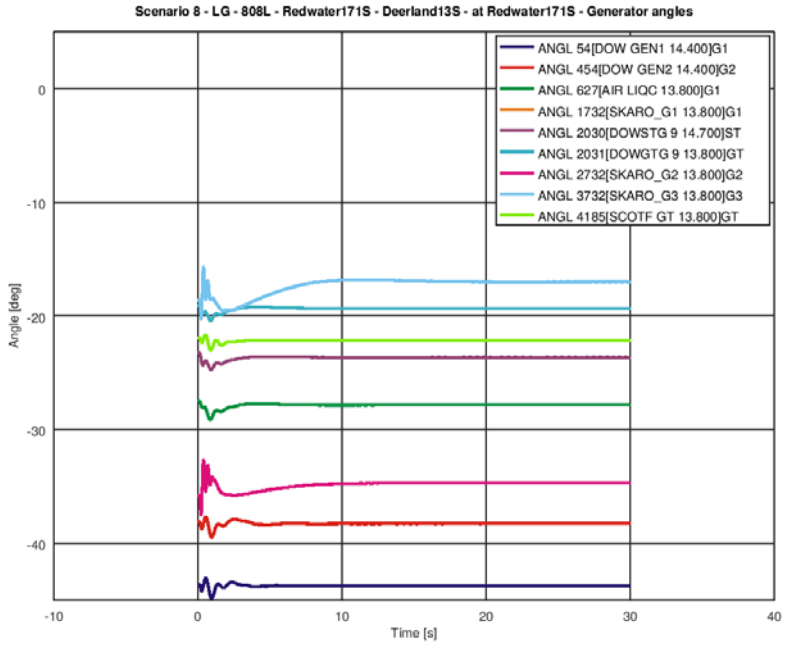


Figure A-1489 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

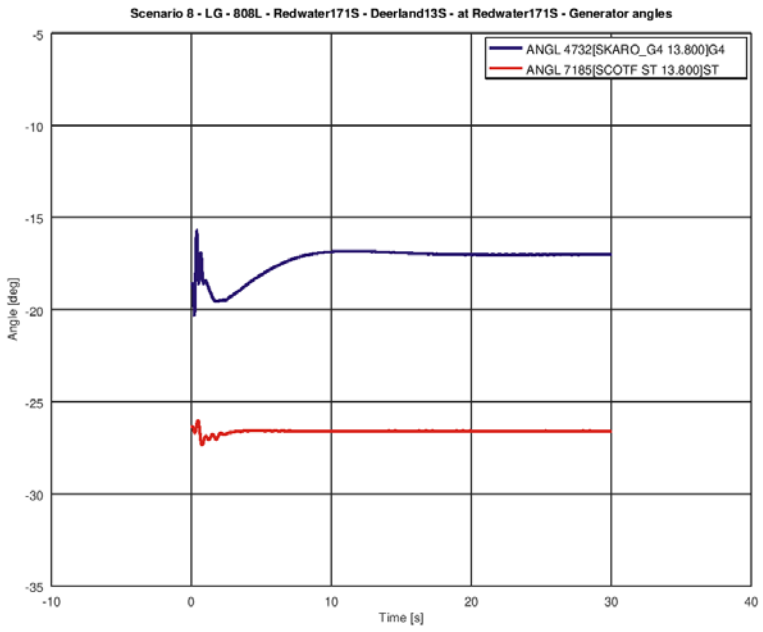


Figure A-1490 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator angles

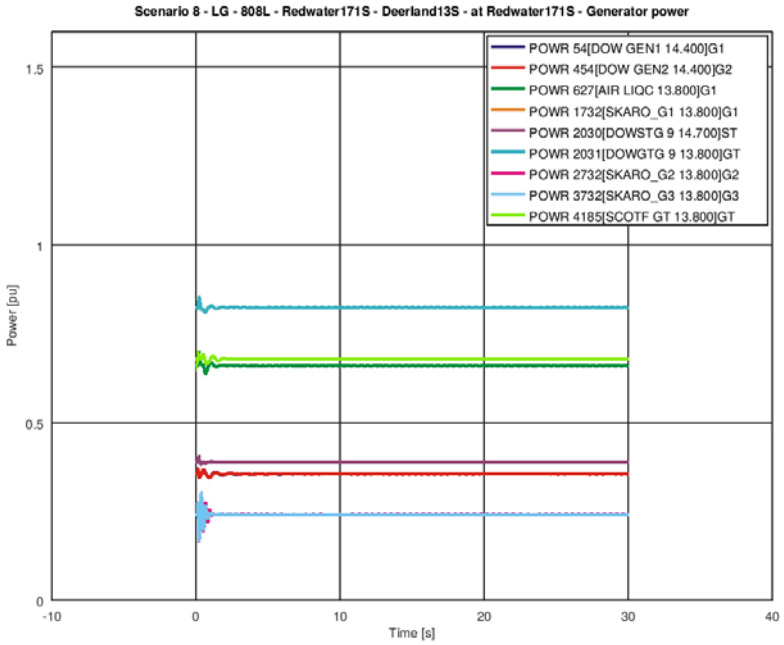


Figure A-1491 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

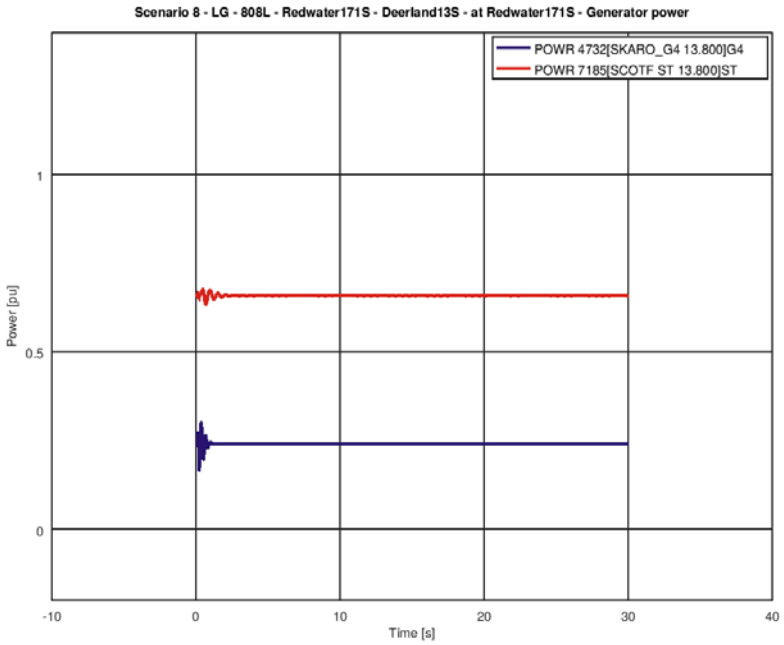


Figure A-1492 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator power

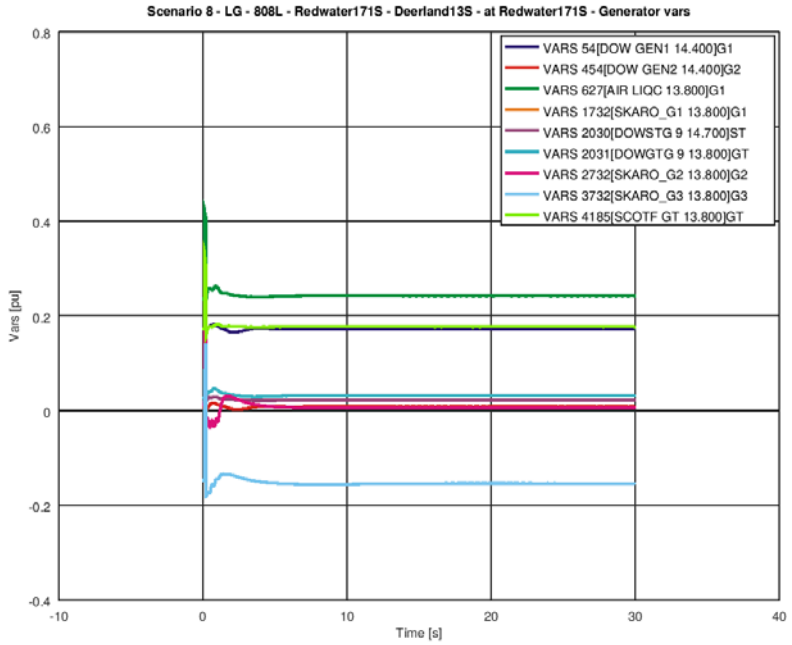


Figure A-1493 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

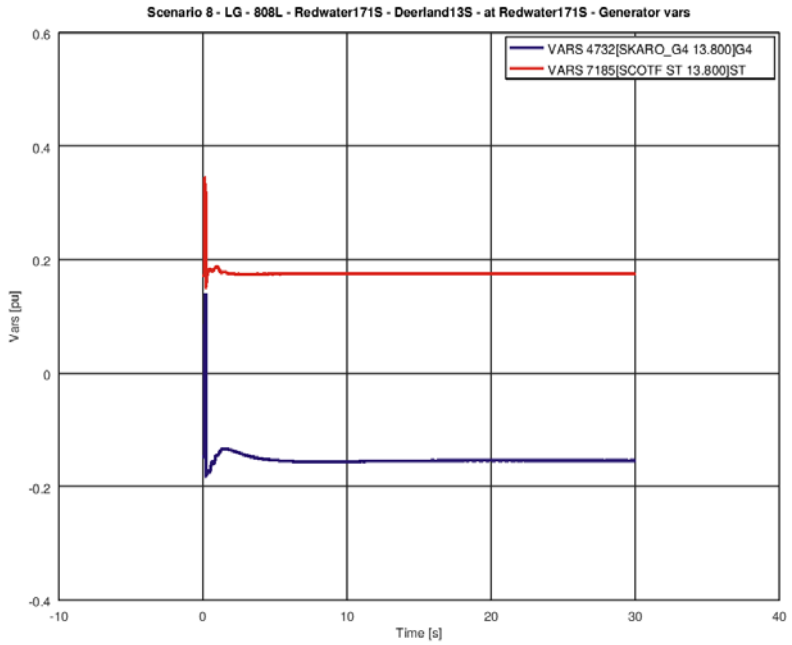


Figure A-1494 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Generator vars

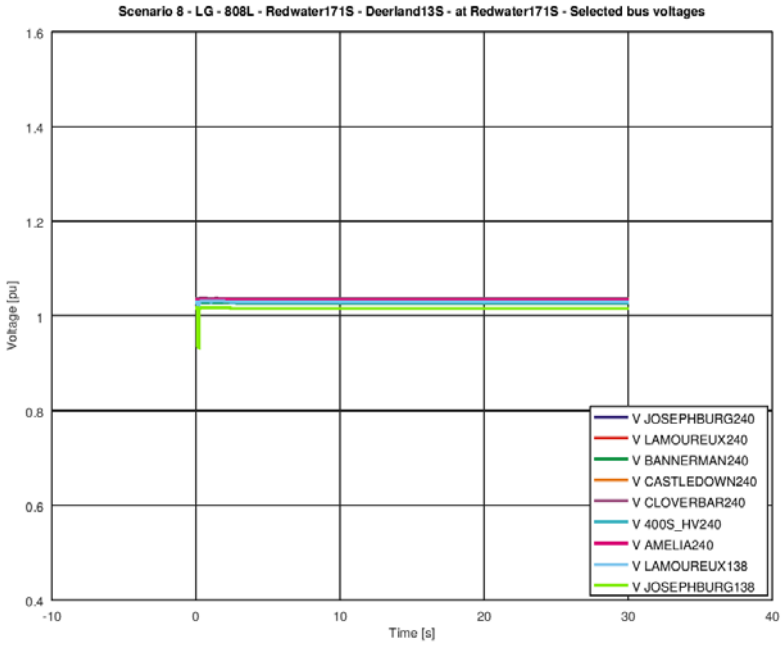


Figure A-1495 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

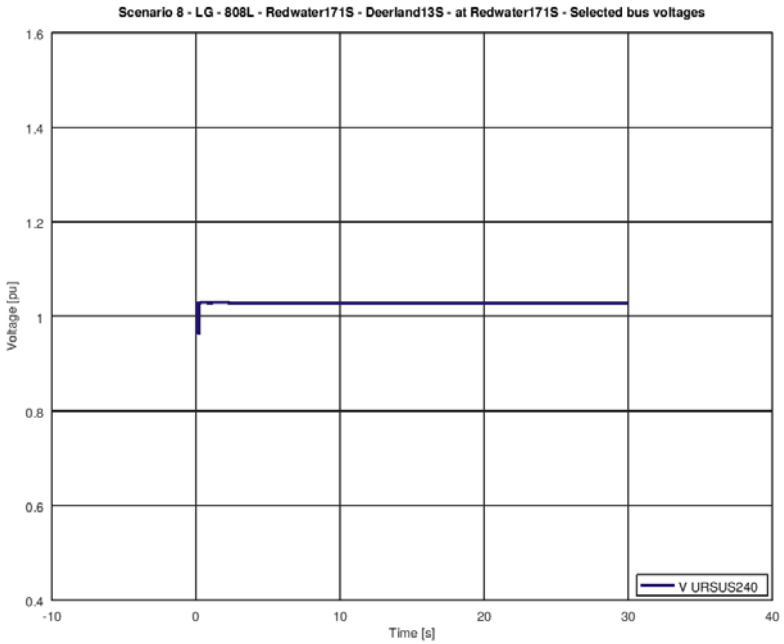


Figure A-1496 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected bus voltages

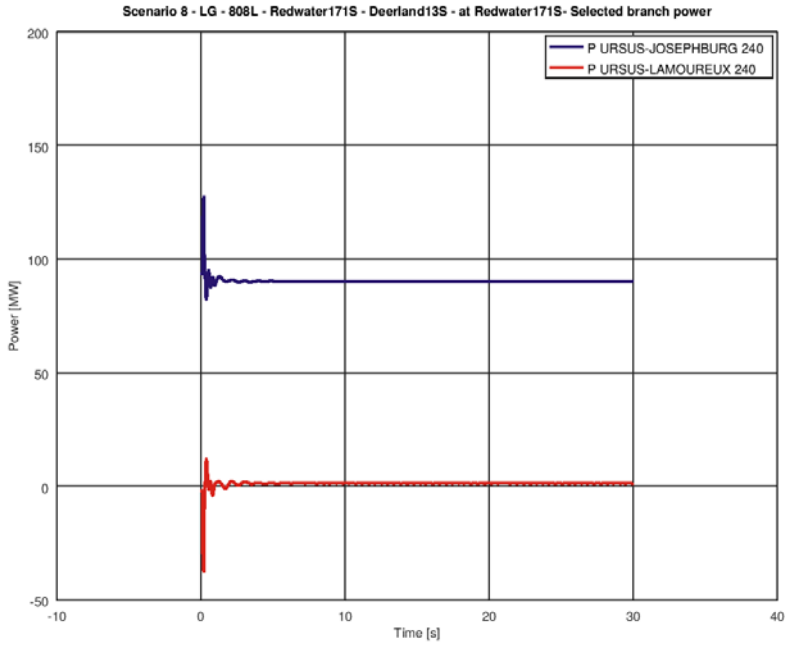


Figure A-1497 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch power

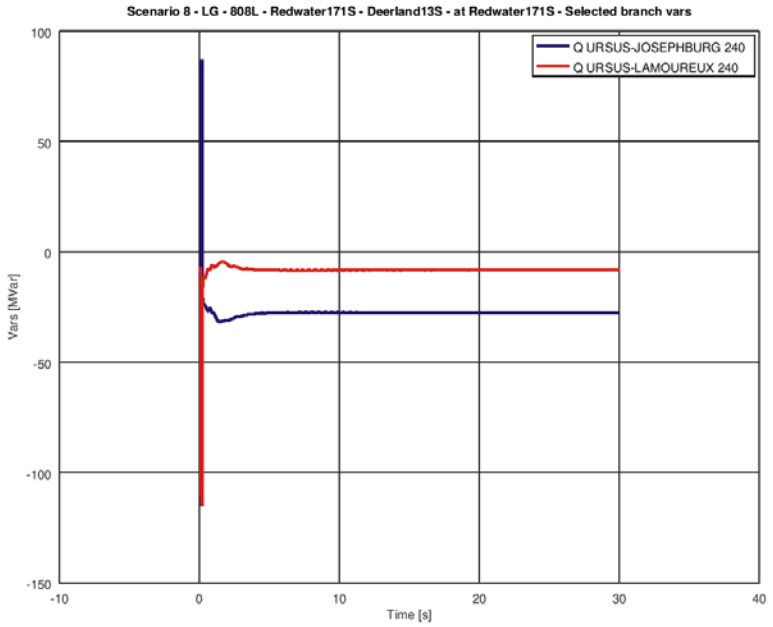


Figure A-1498 Scenario 8 - LG - 808L - Redwater171S - Deerland13S - at Redwater171S - Selected branch vars

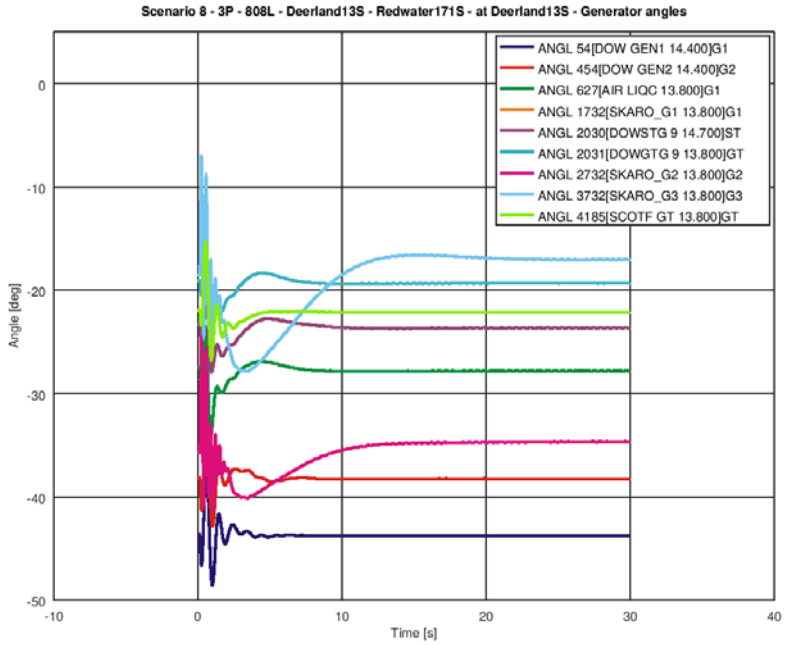


Figure A-1499 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

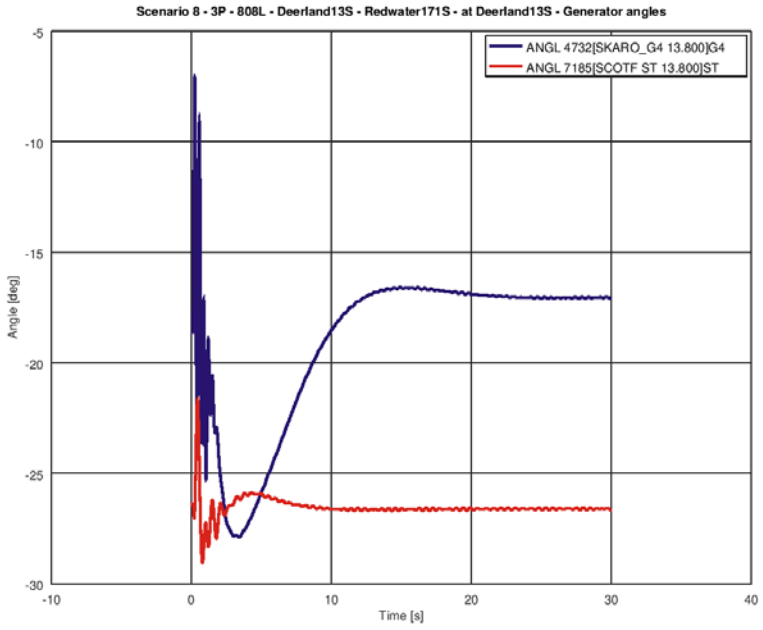


Figure A-1500 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

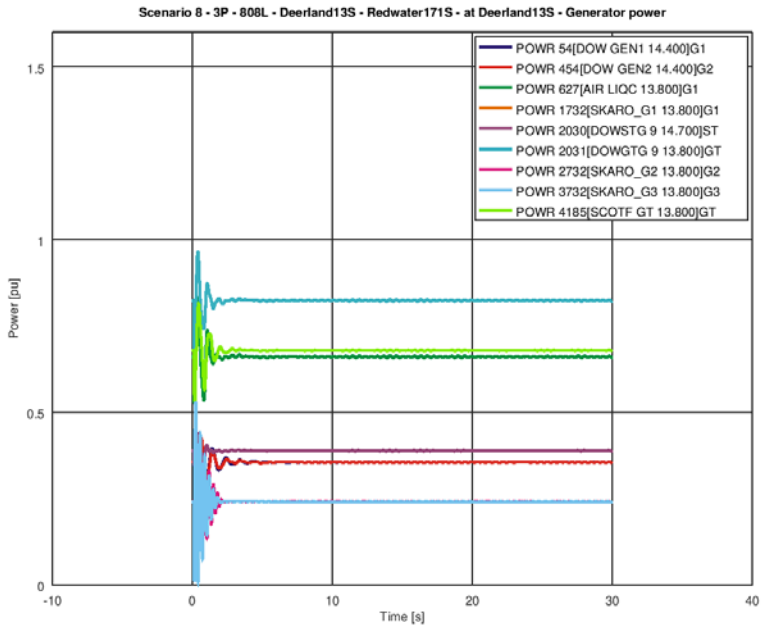


Figure A-1501 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

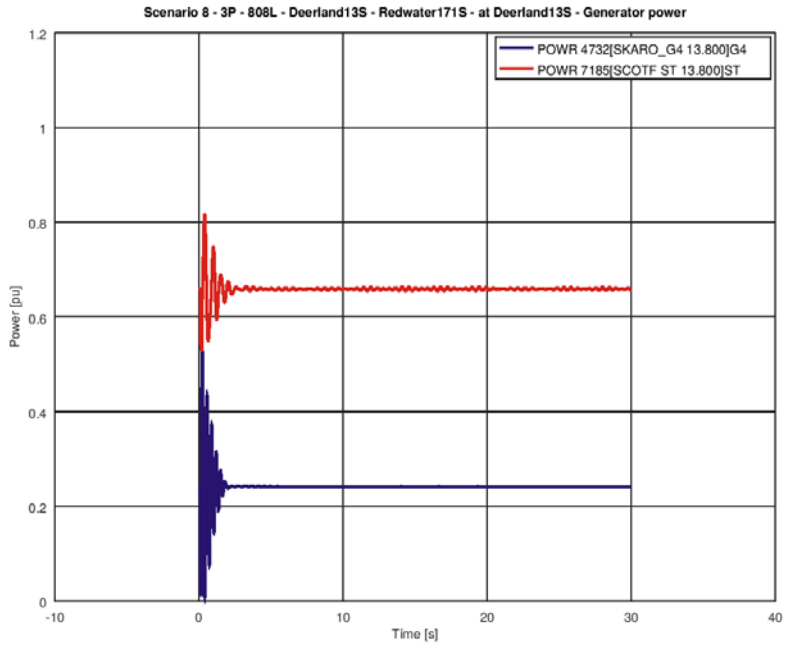


Figure A-1502 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

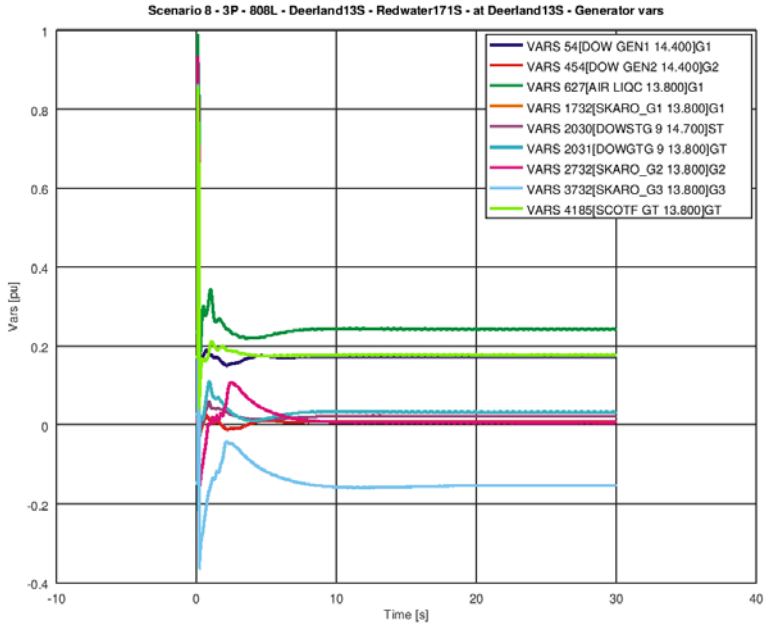


Figure A-1503 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

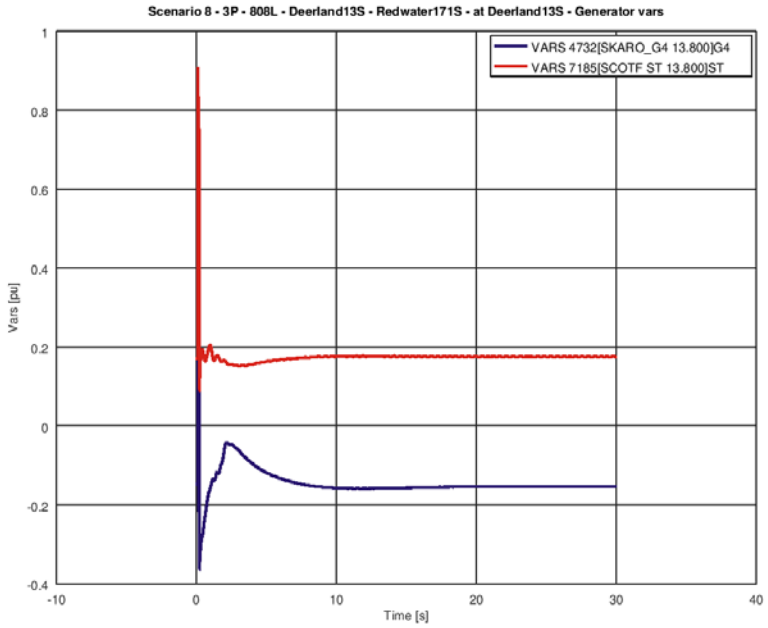


Figure A-1504 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

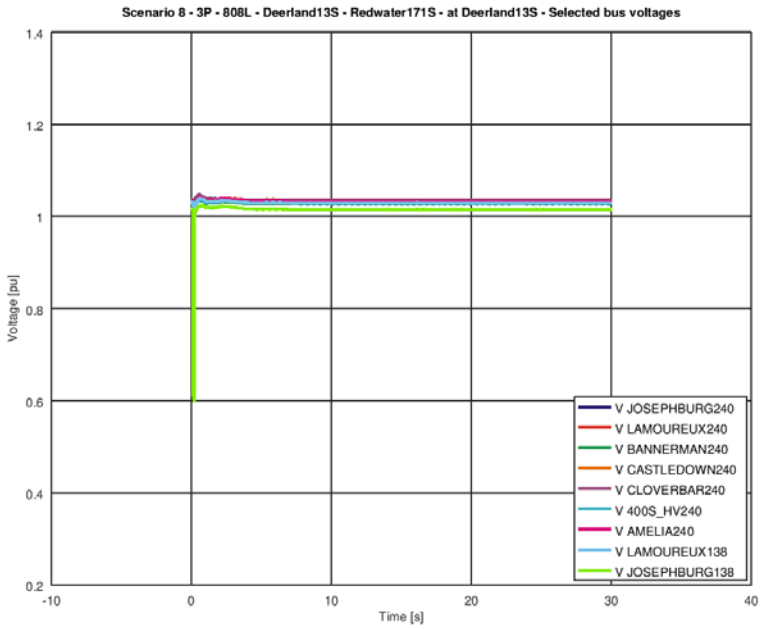


Figure A-1505 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

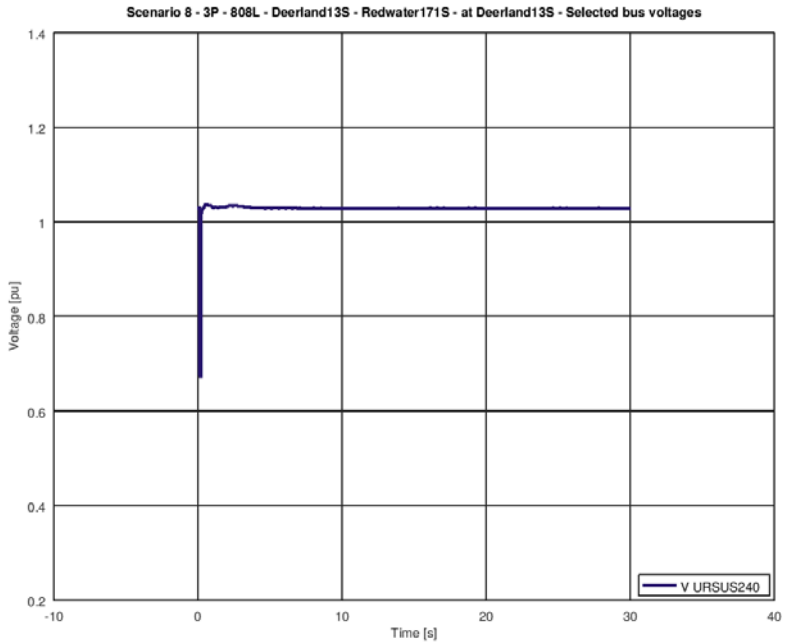


Figure A-1506 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

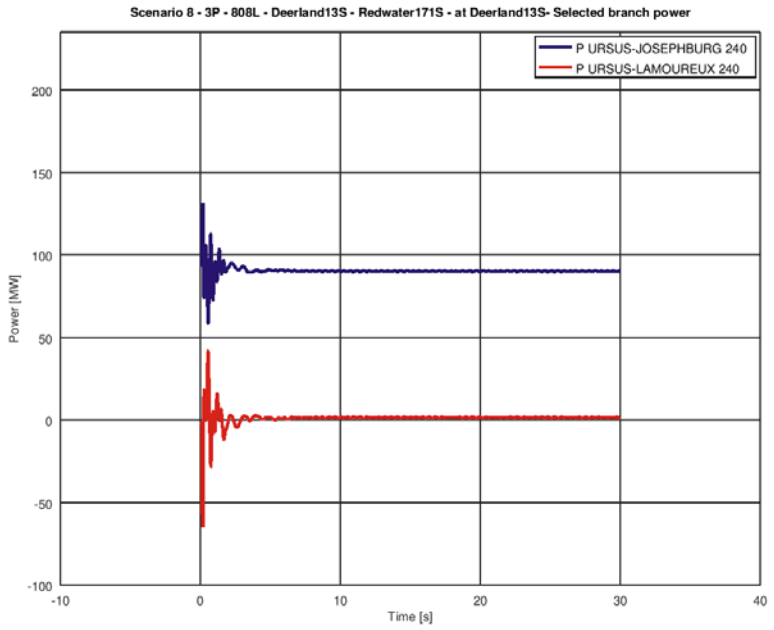


Figure A-1507 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

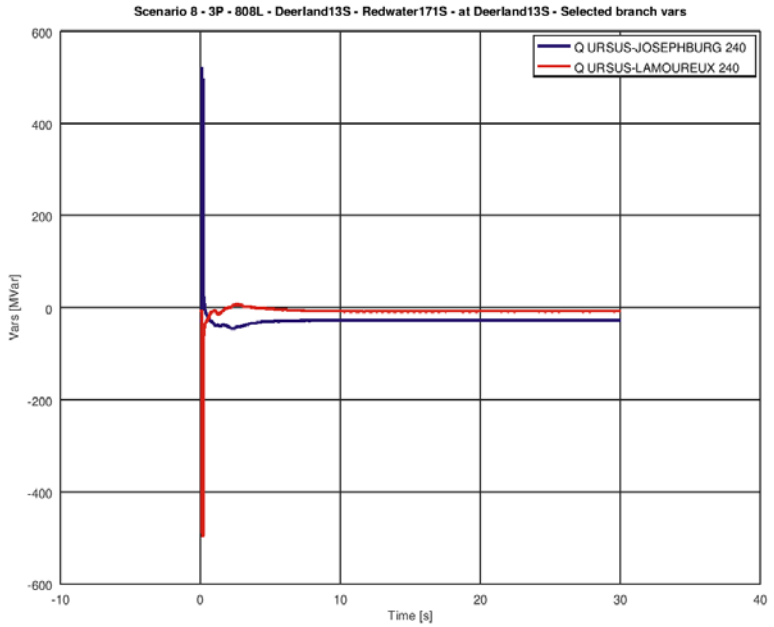


Figure A-1508 Scenario 8 - 3P - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

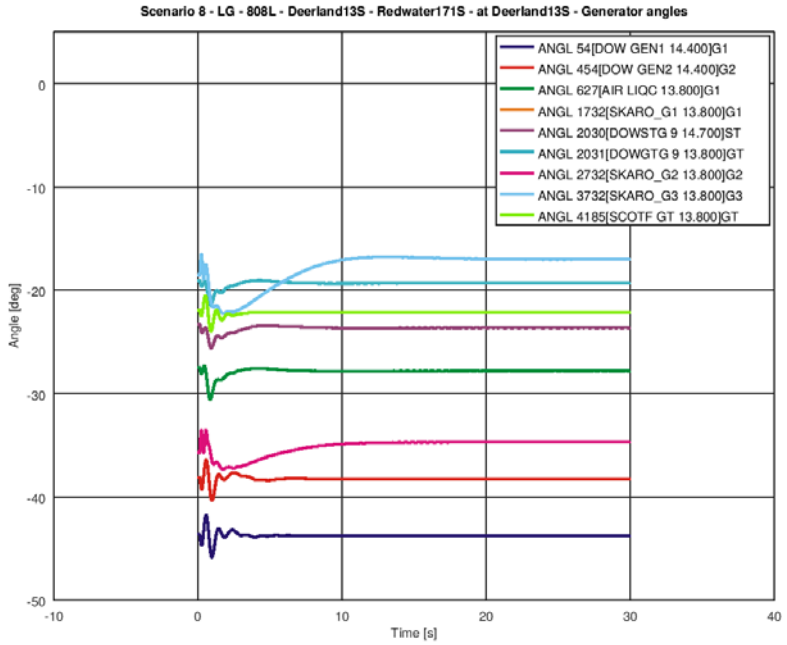


Figure A-1509 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

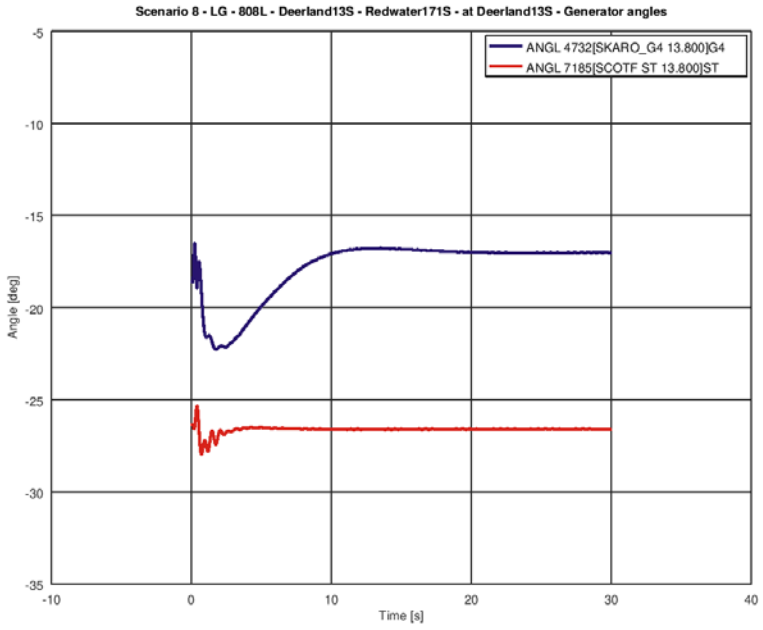


Figure A-1510 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator angles

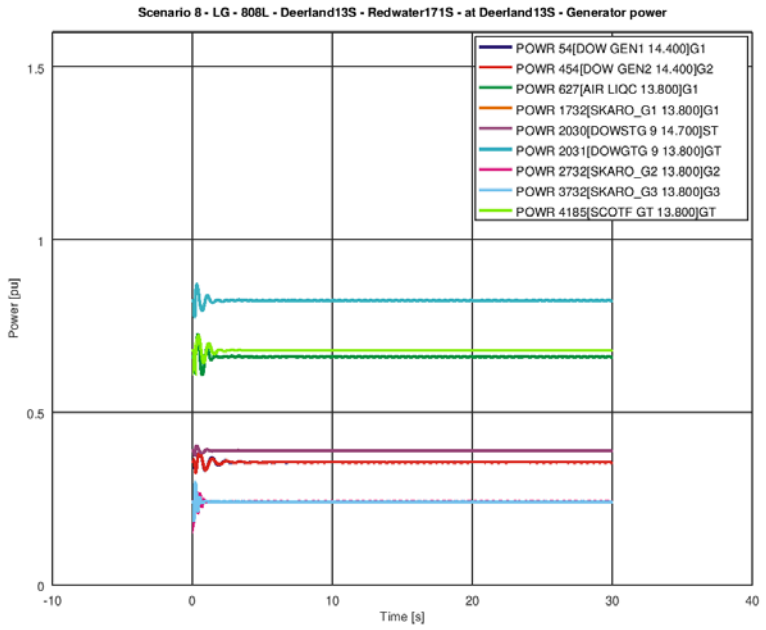


Figure A-1511 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

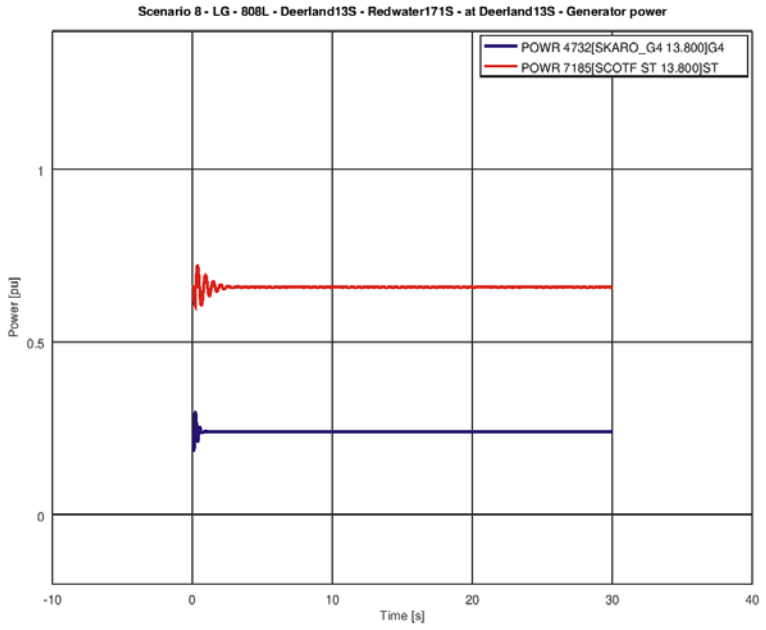


Figure A-1512 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator power

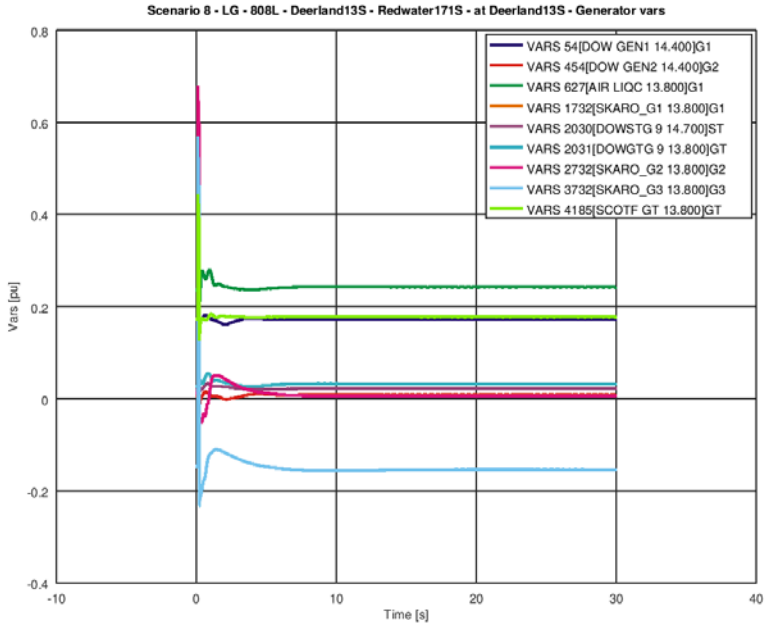


Figure A-1513 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

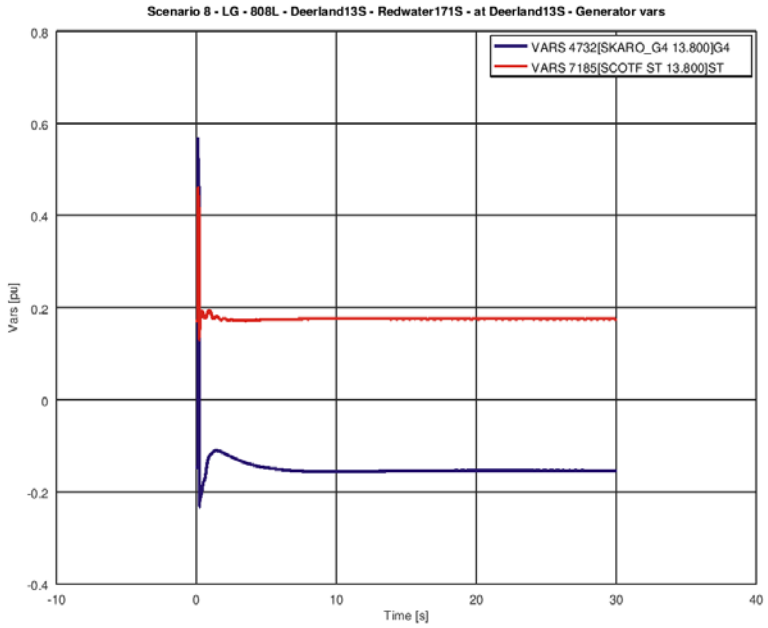


Figure A-1514 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Generator vars

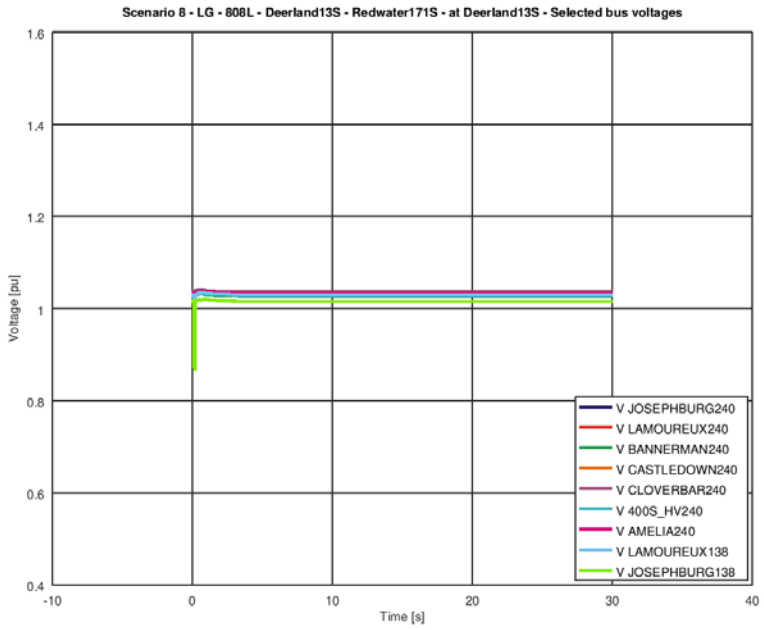


Figure A-1515 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

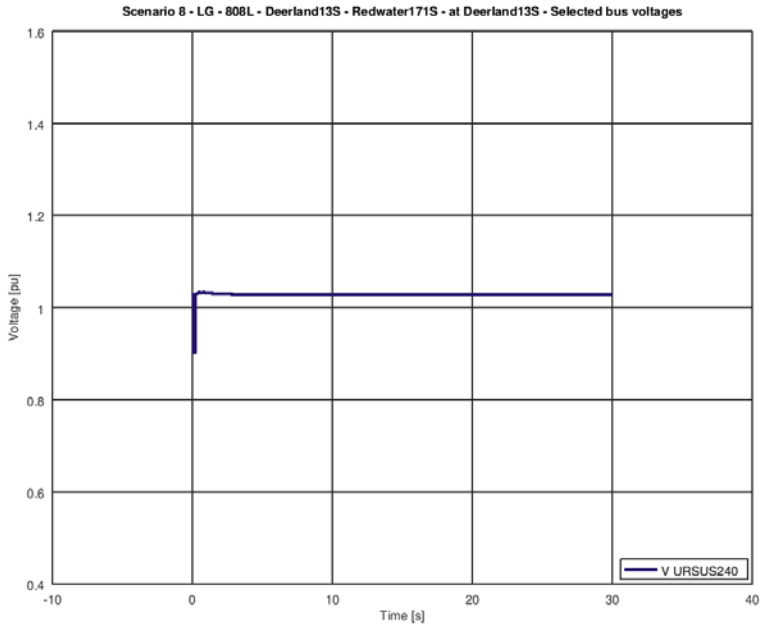


Figure A-1516 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected bus voltages

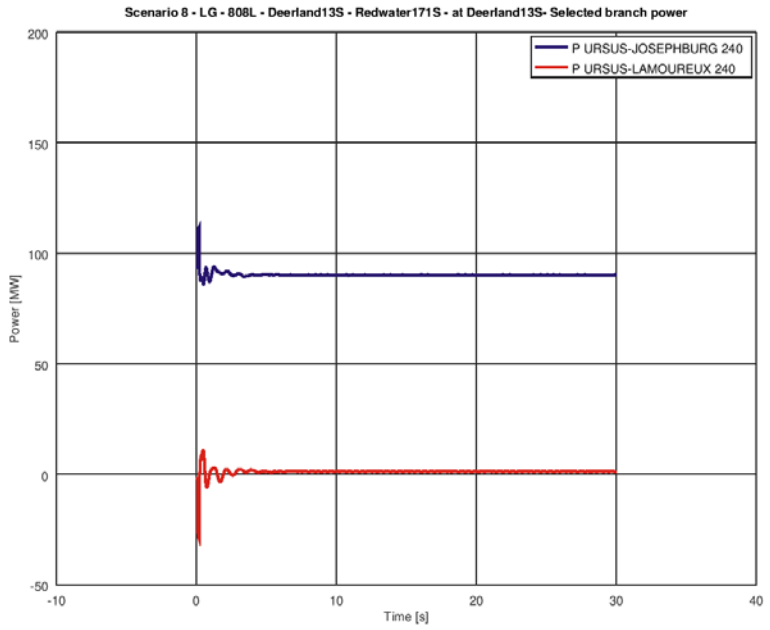


Figure A-1517 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch power

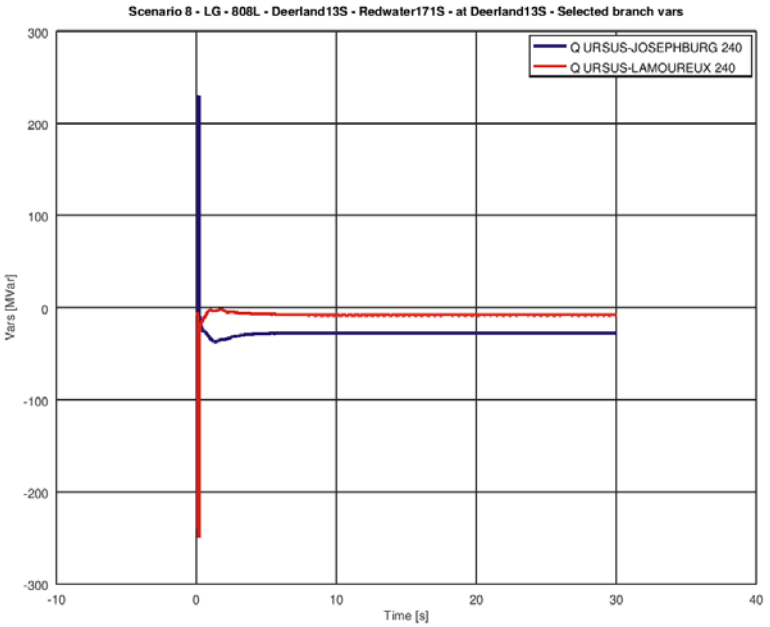


Figure A-1518 Scenario 8 - LG - 808L - Deerland13S - Redwater171S - at Deerland13S - Selected branch vars

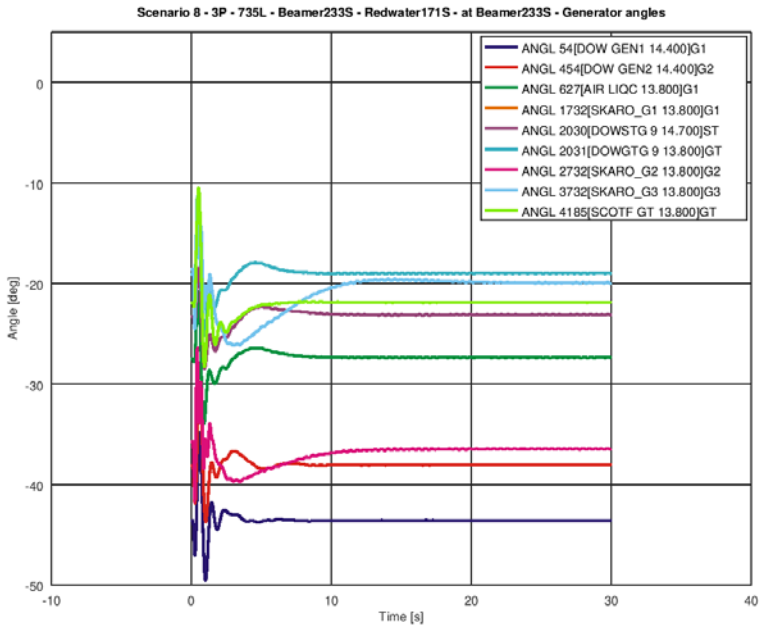


Figure A-1519 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

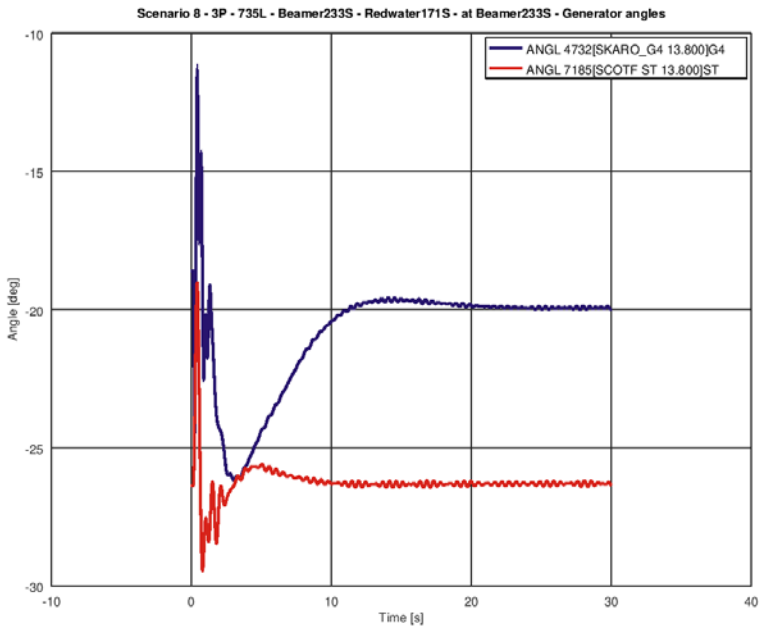


Figure A-1520 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

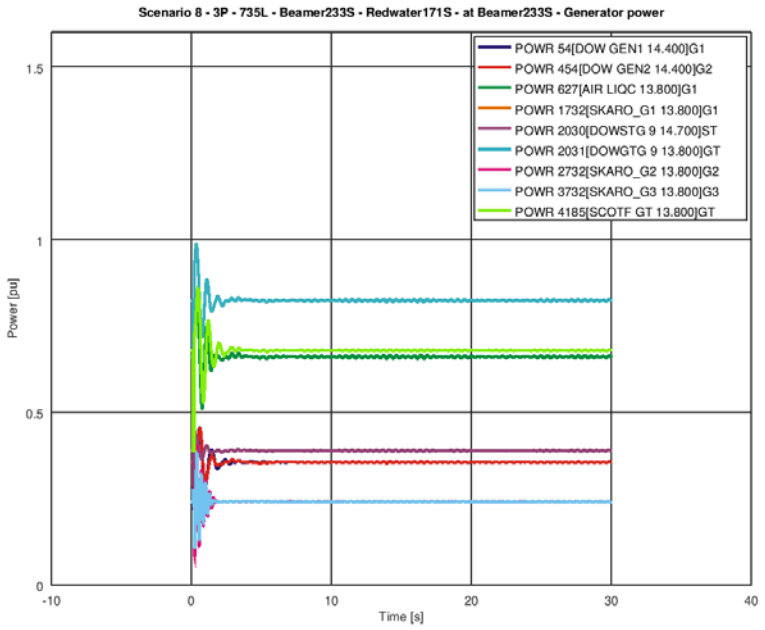


Figure A-1521 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

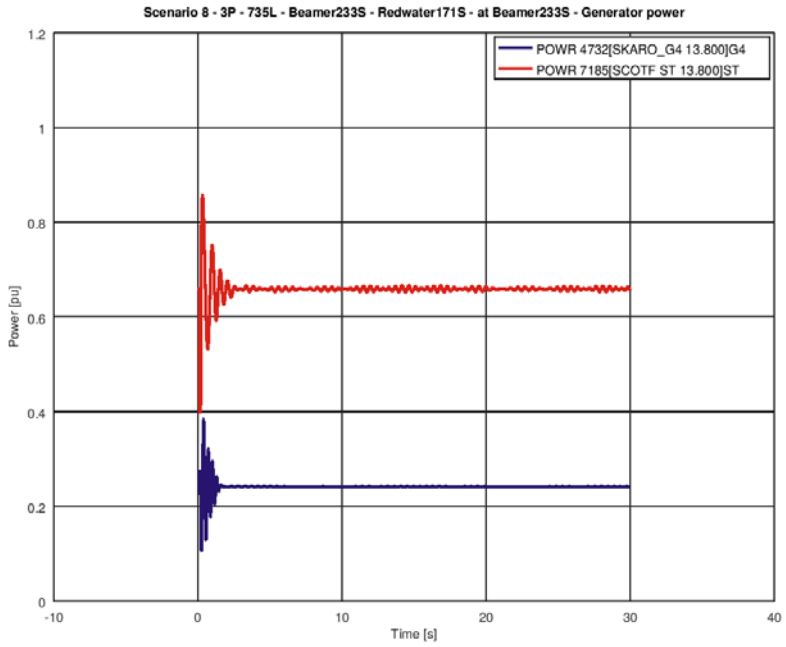


Figure A-1522 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

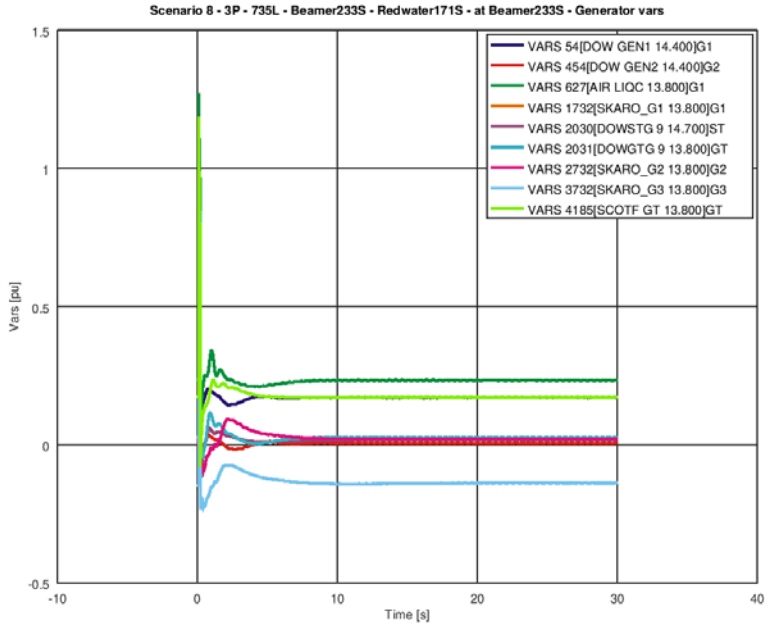


Figure A-1523 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

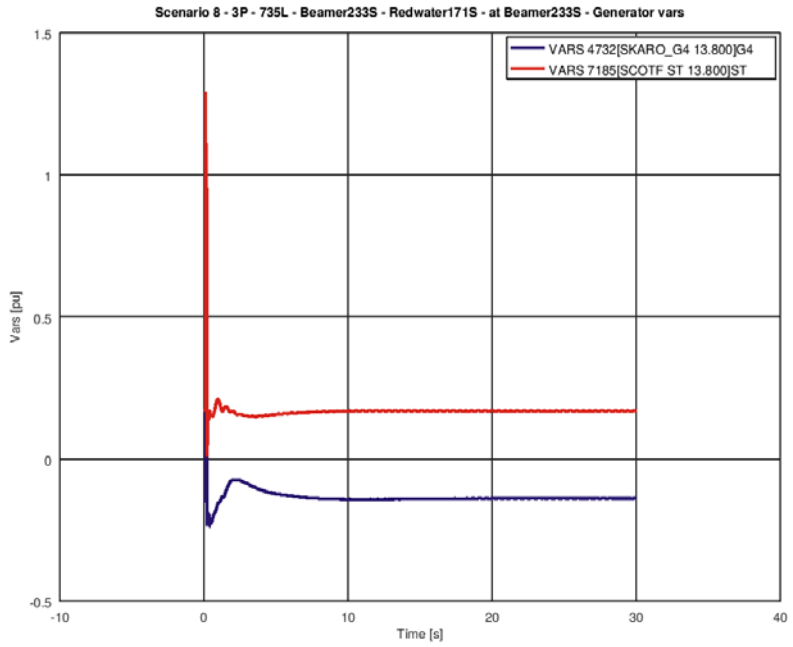


Figure A-1524 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

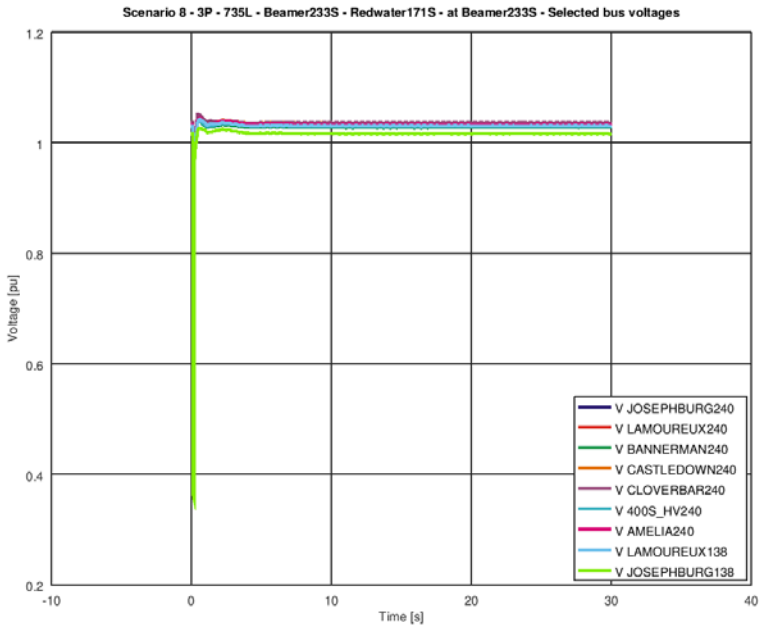


Figure A-1525 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

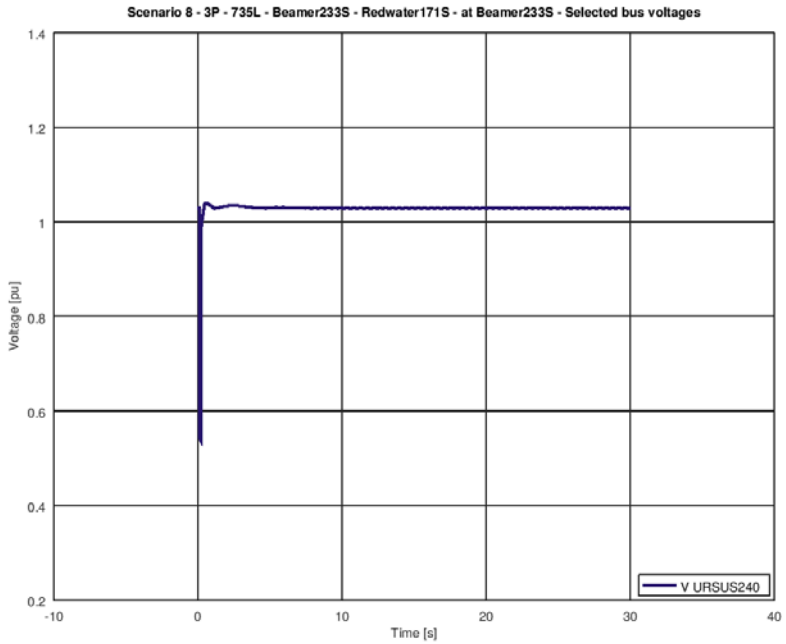


Figure A-1526 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

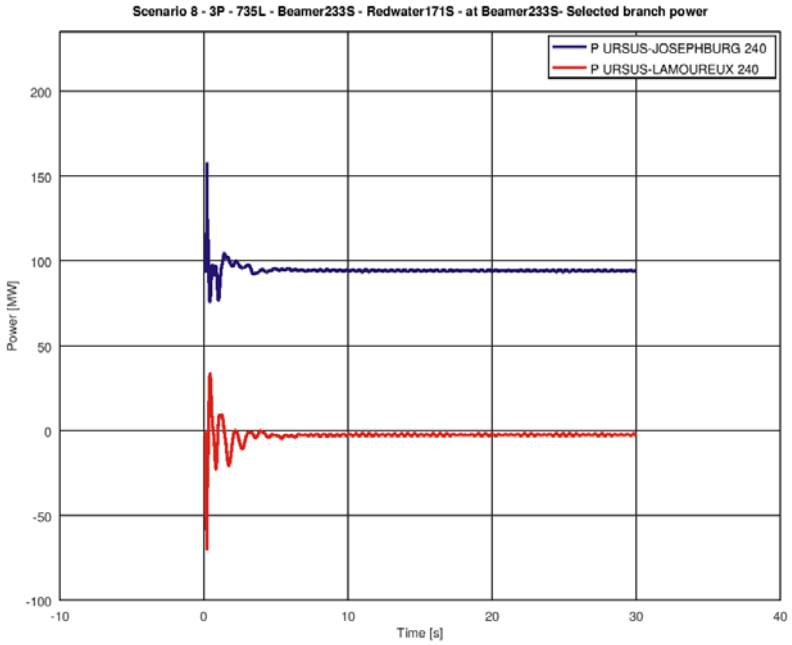


Figure A-1527 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

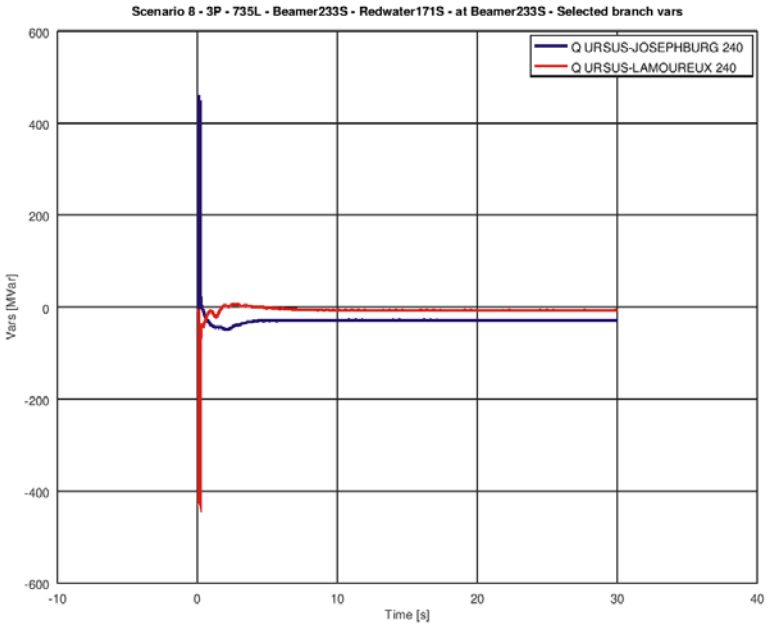


Figure A-1528 Scenario 8 - 3P - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

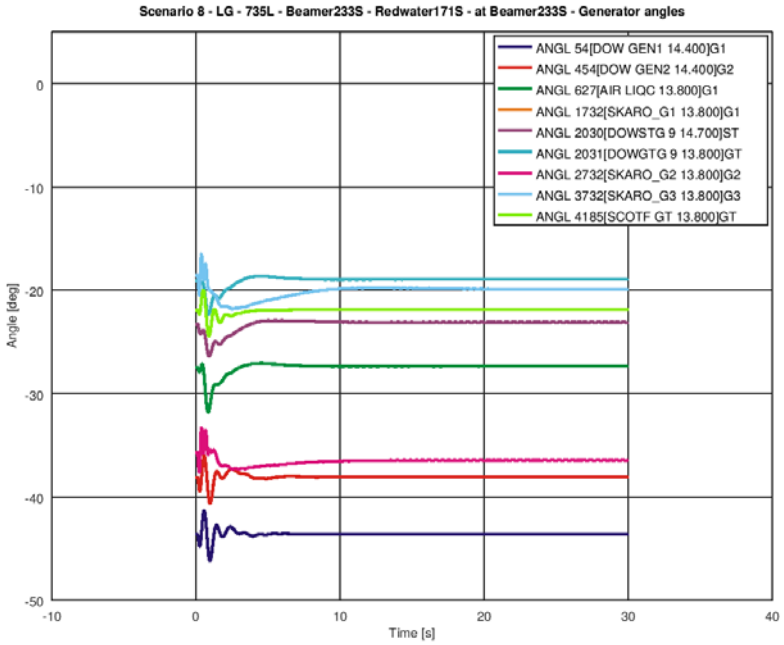


Figure A-1529 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

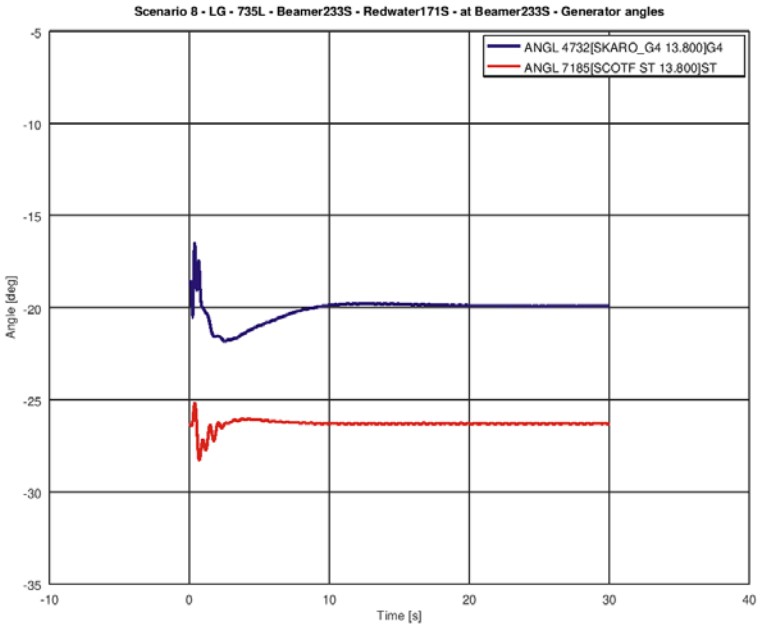


Figure A-1530 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator angles

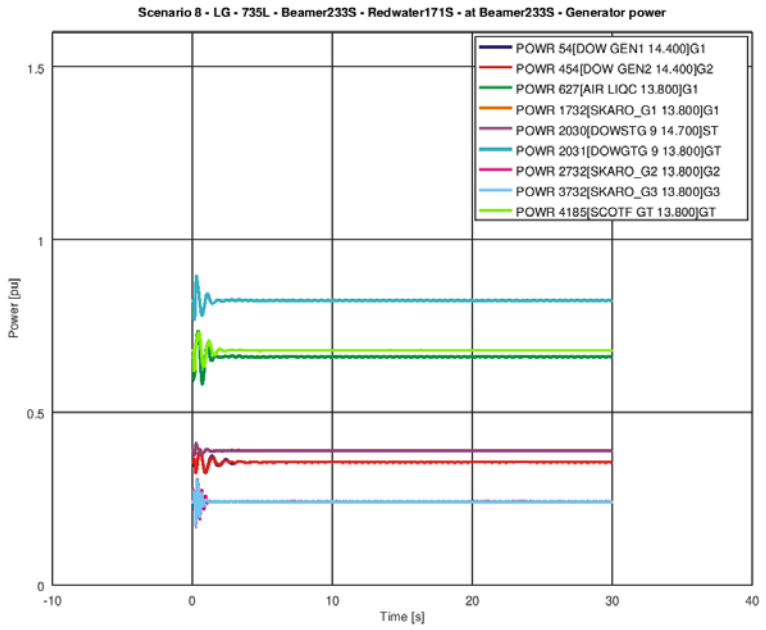


Figure A-1531 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

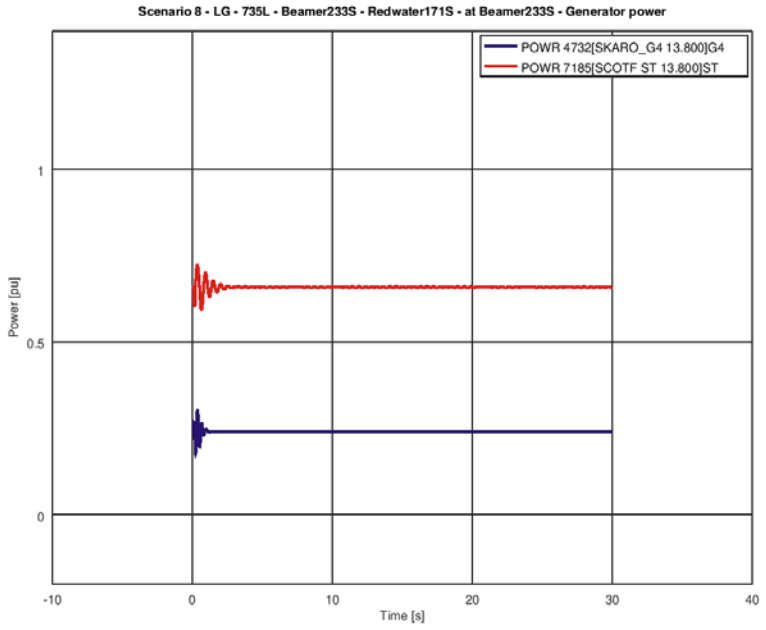


Figure A-1532 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator power

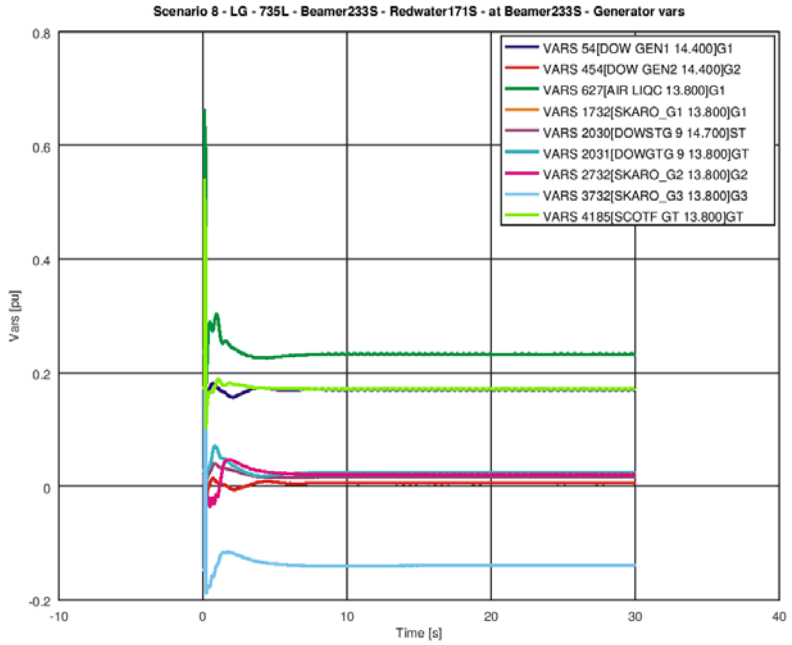


Figure A-1533 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

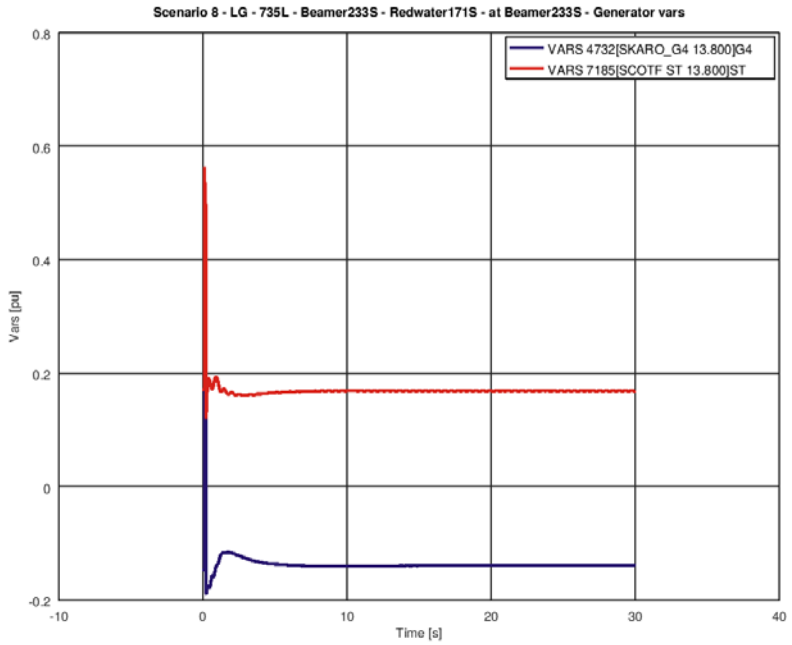


Figure A-1534 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Generator vars

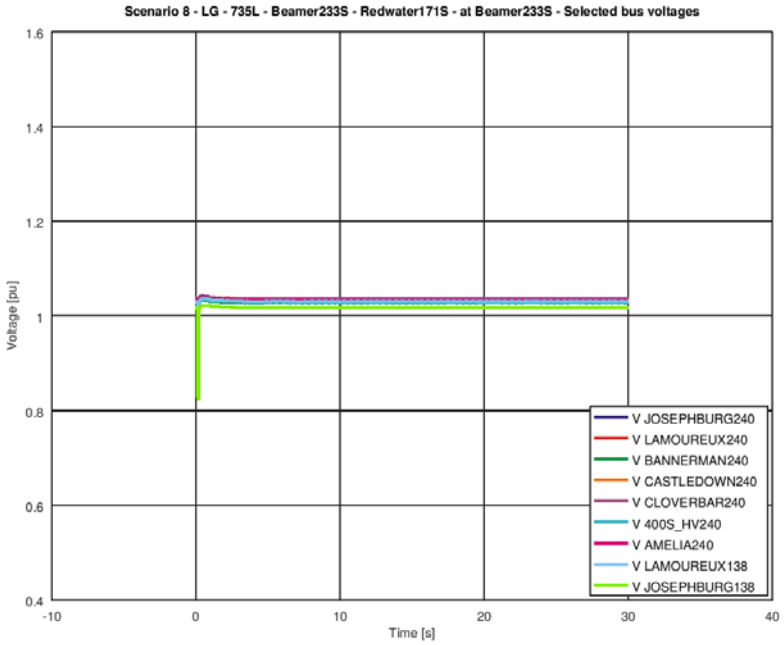


Figure A-1535 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

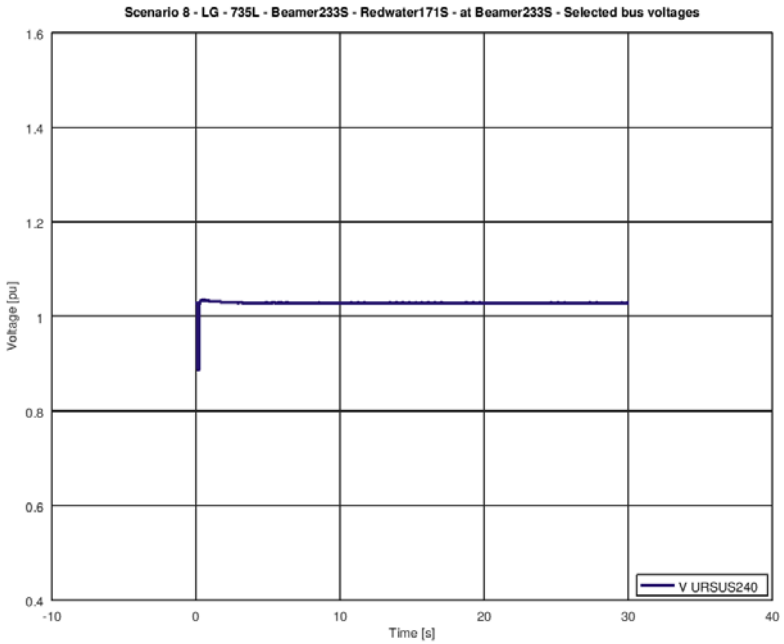


Figure A-1536 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected bus voltages

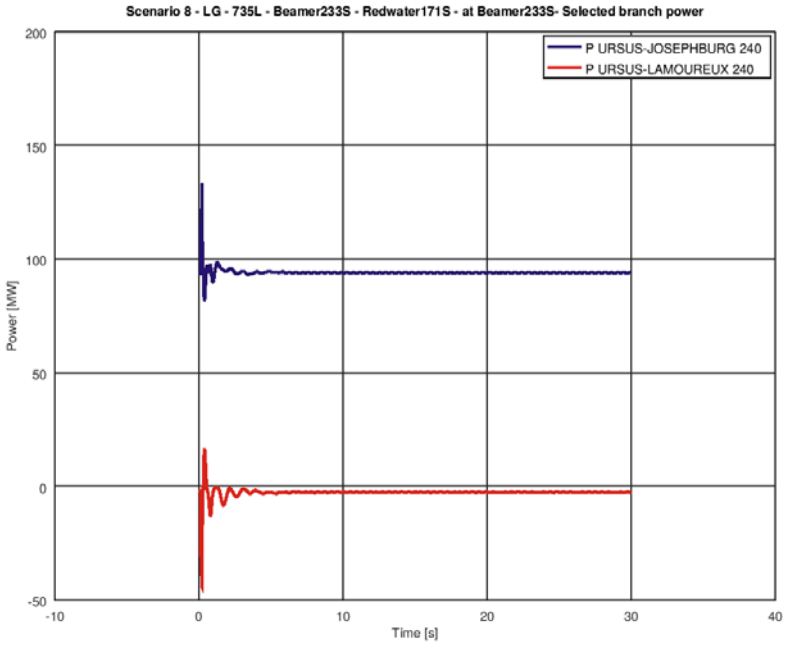


Figure A-1537 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch power

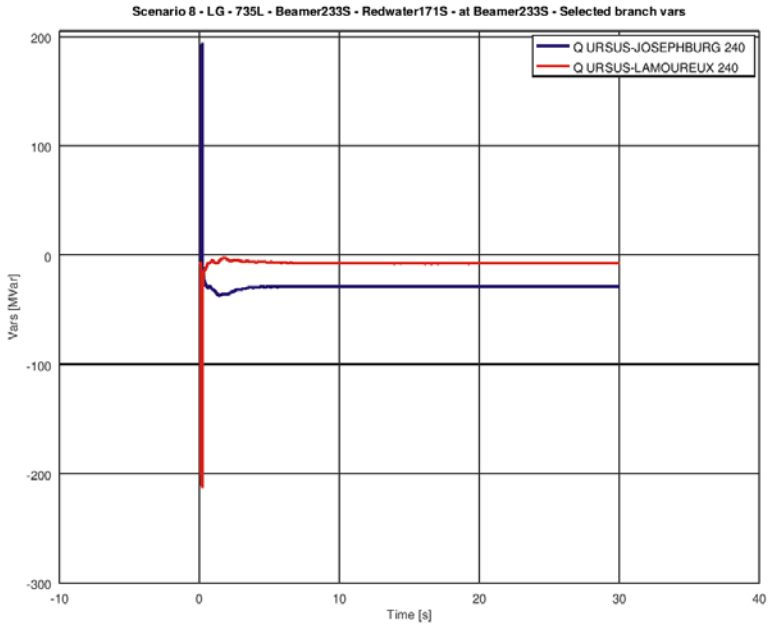


Figure A-1538 Scenario 8 - LG - 735L - Beamer233S - Redwater171S - at Beamer233S - Selected branch vars

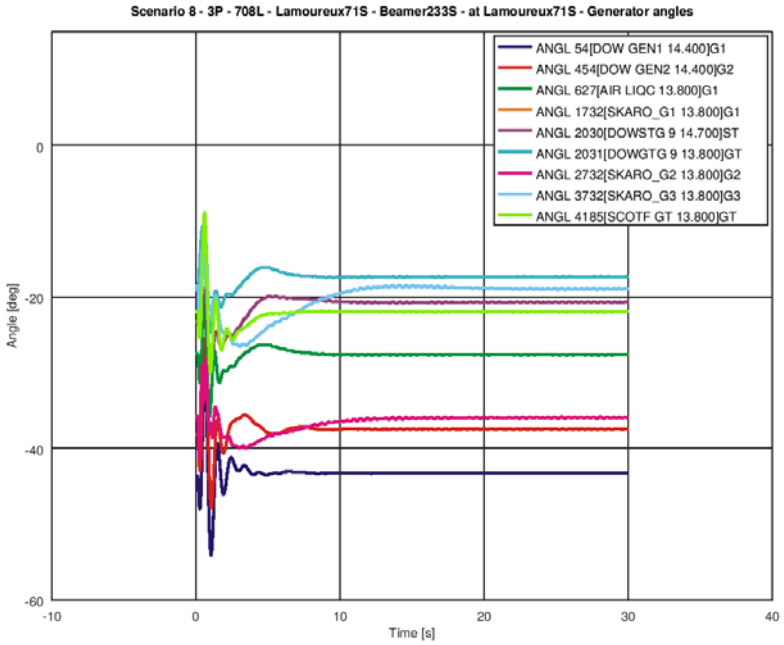


Figure A-1539 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

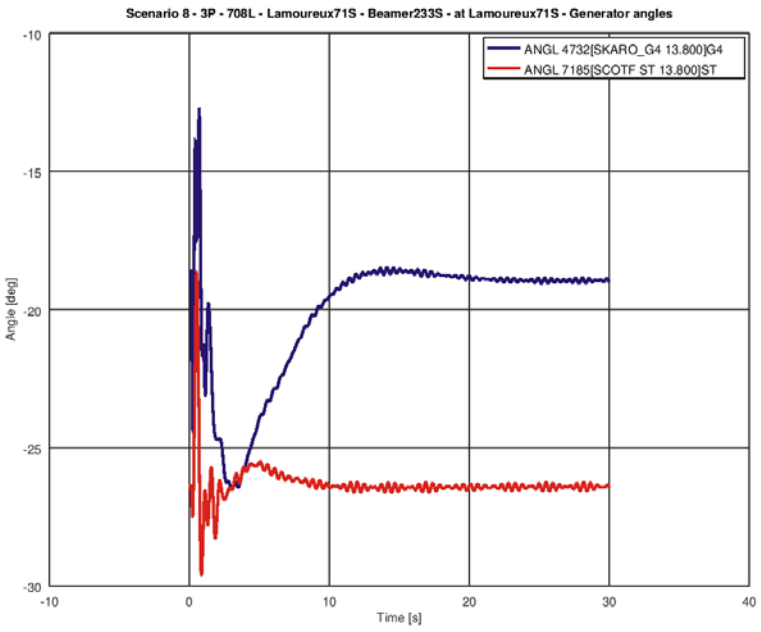


Figure A-1540 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

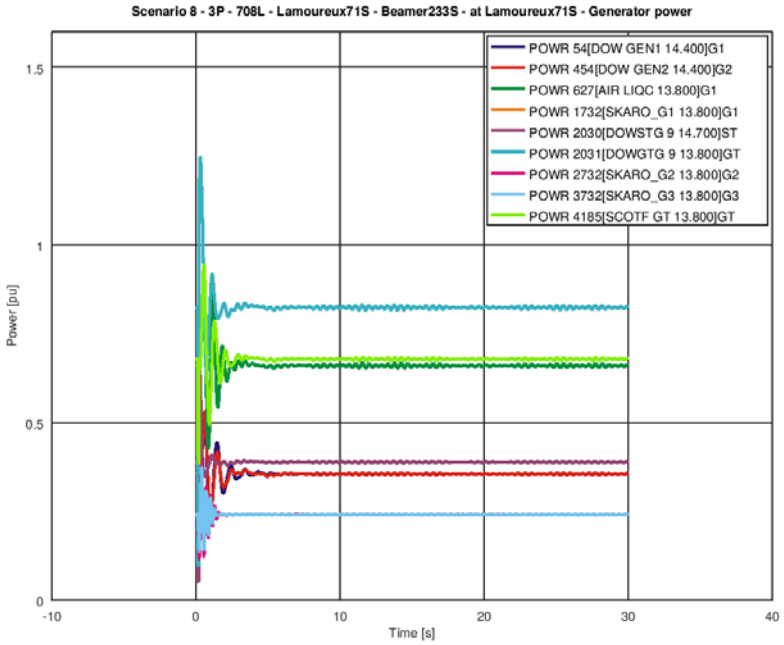


Figure A-1541 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

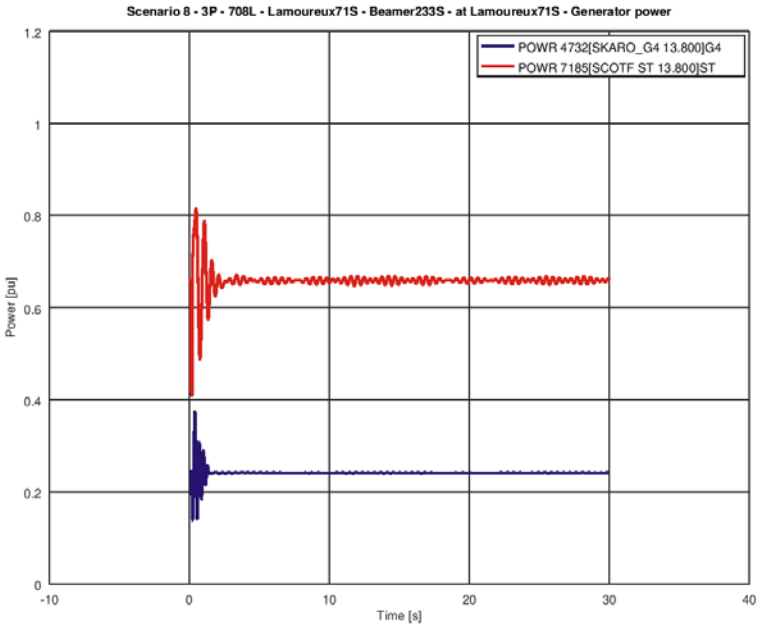


Figure A-1542 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

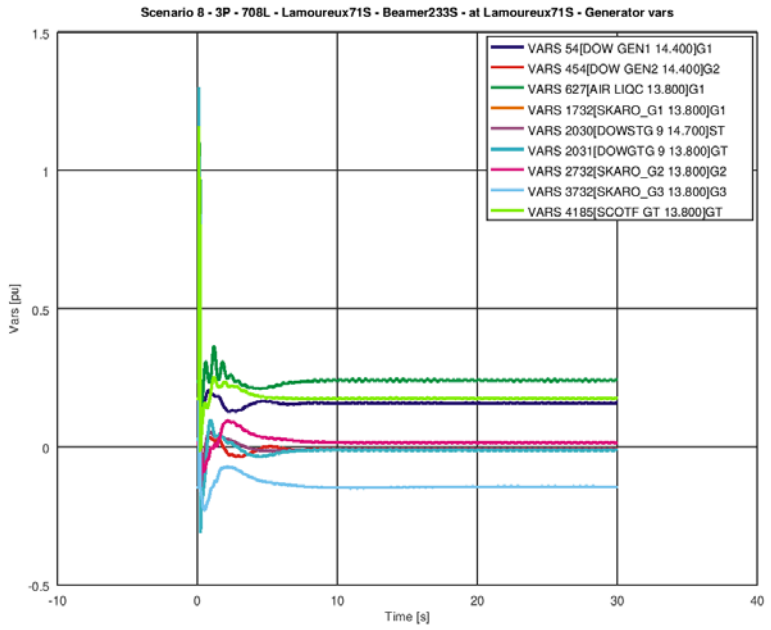


Figure A-1543 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

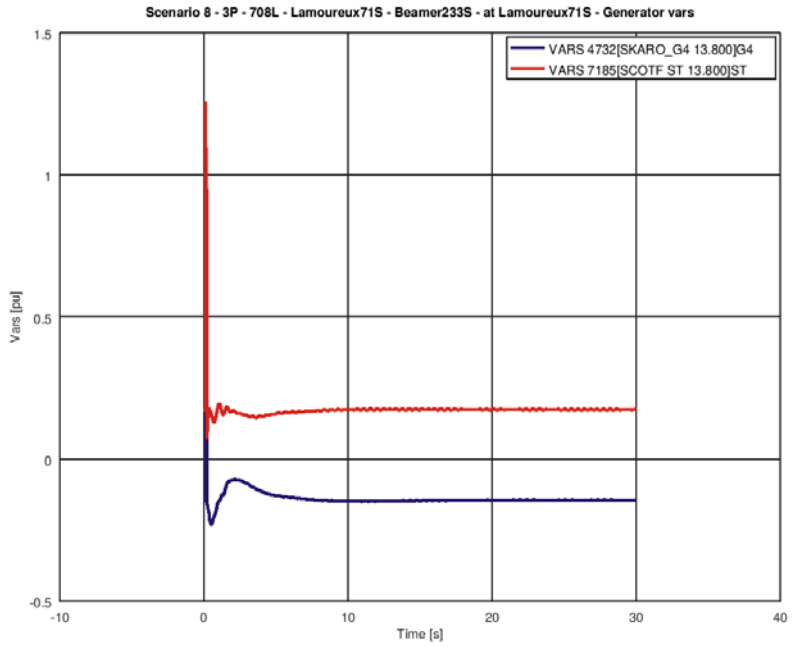


Figure A-1544 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

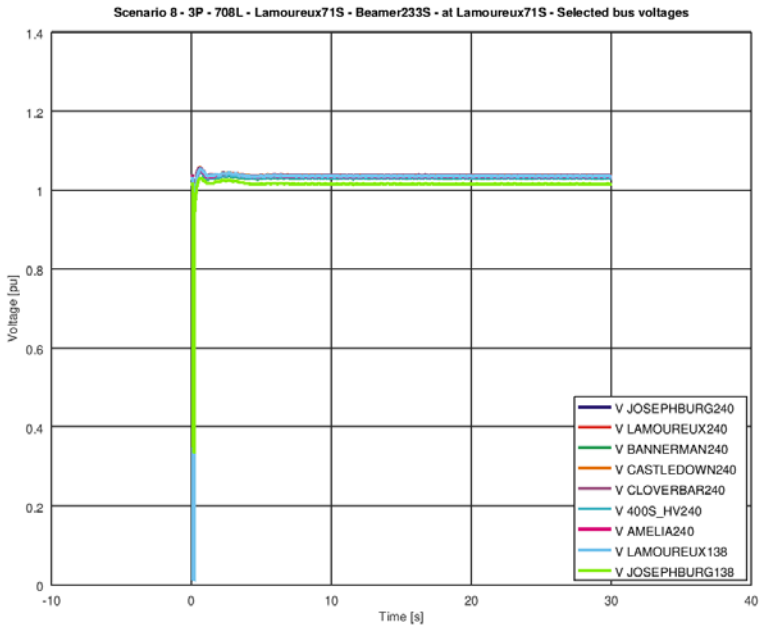


Figure A-1545 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

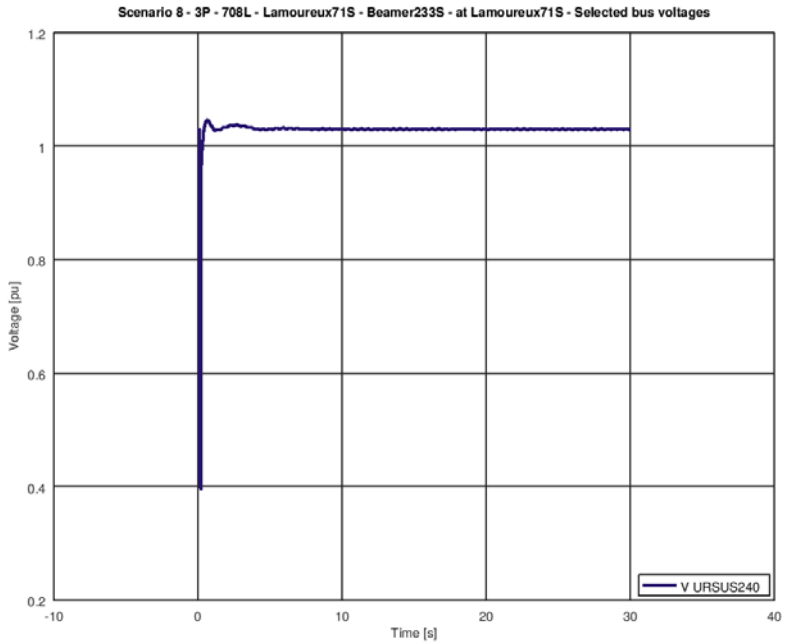


Figure A-1546 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

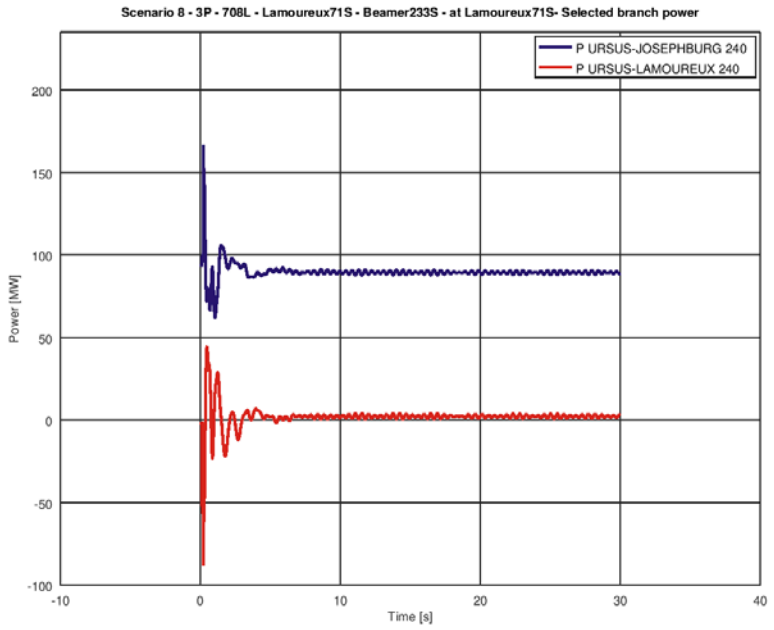


Figure A-1547 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

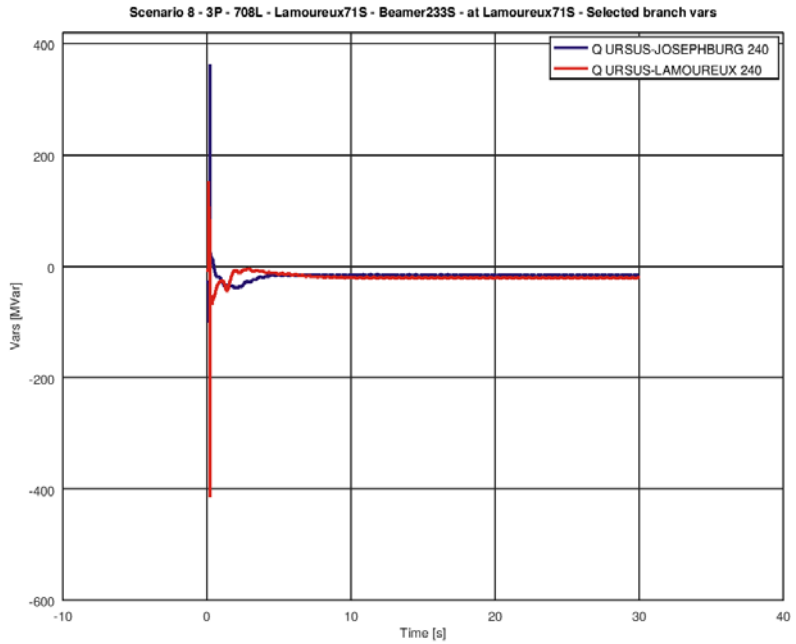


Figure A-1548 Scenario 8 - 3P - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

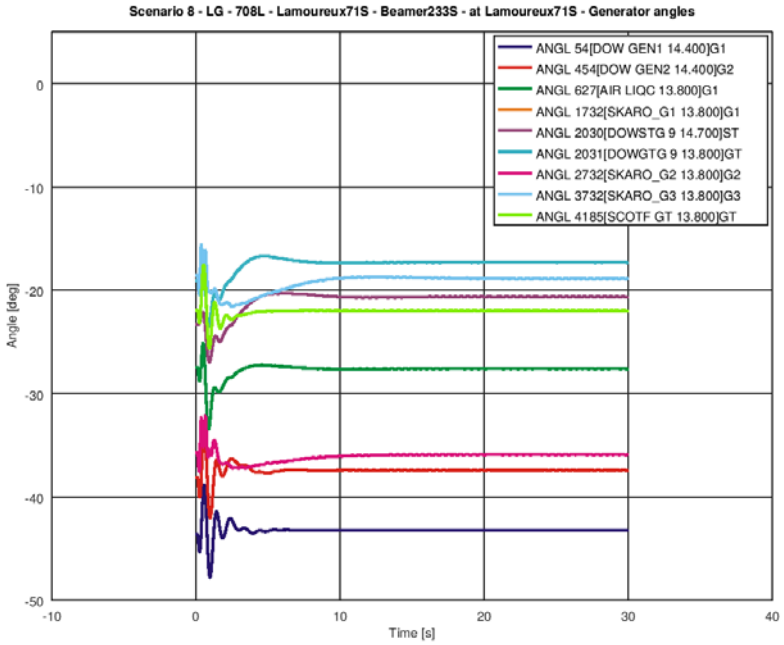


Figure A-1549 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

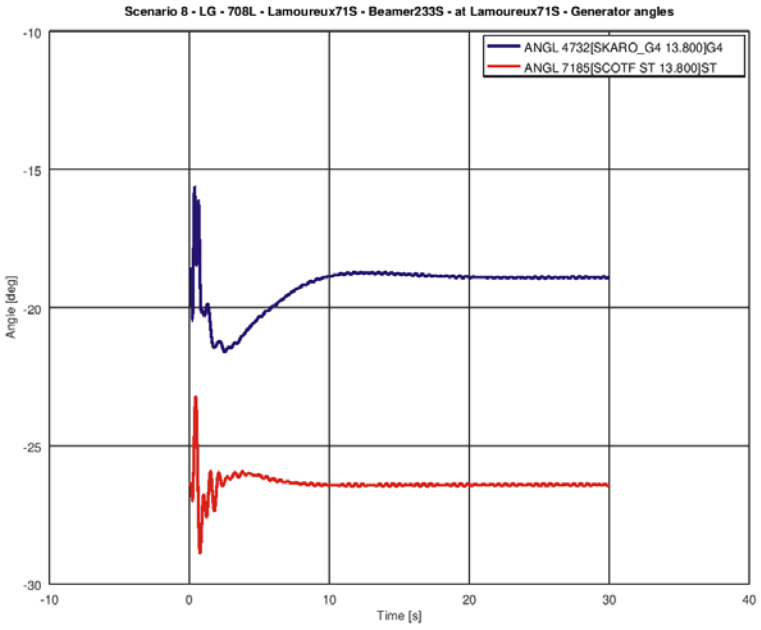


Figure A-1550 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator angles

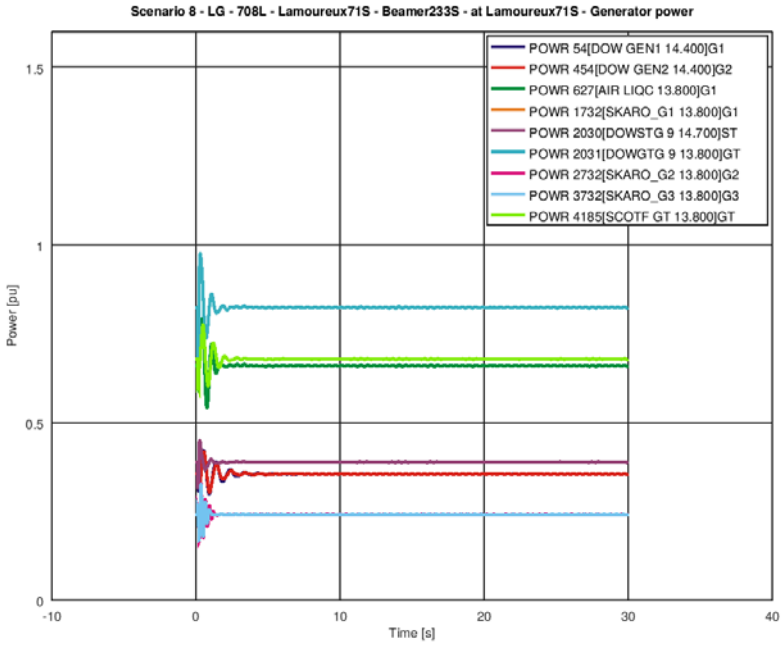


Figure A-1551 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

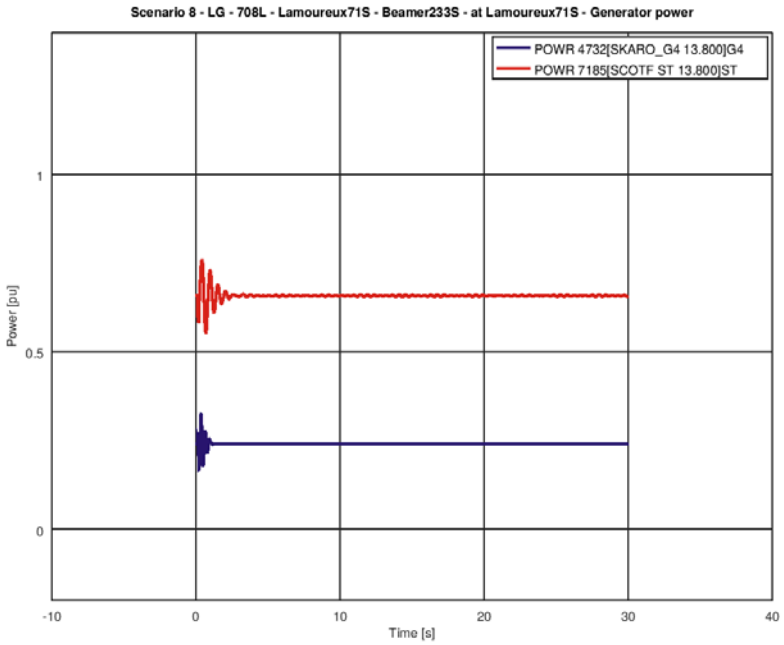


Figure A-1552 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator power

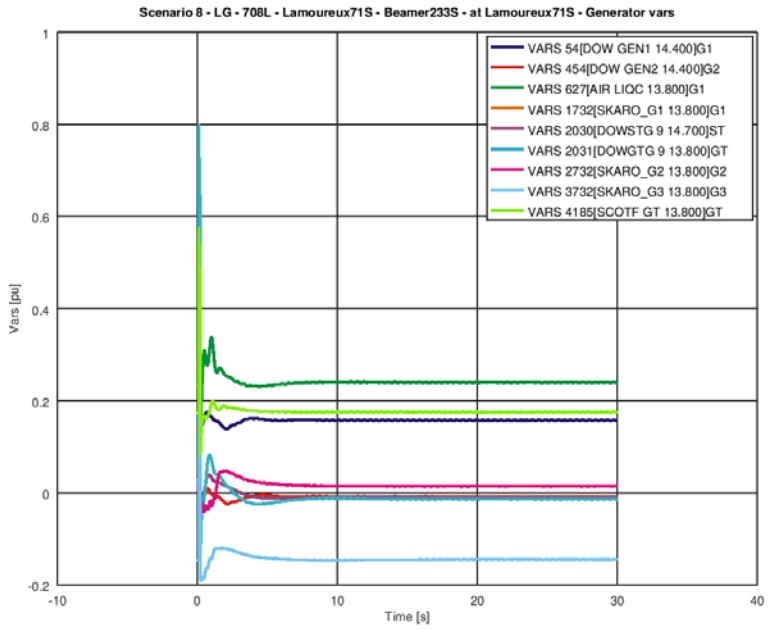


Figure A-1553 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

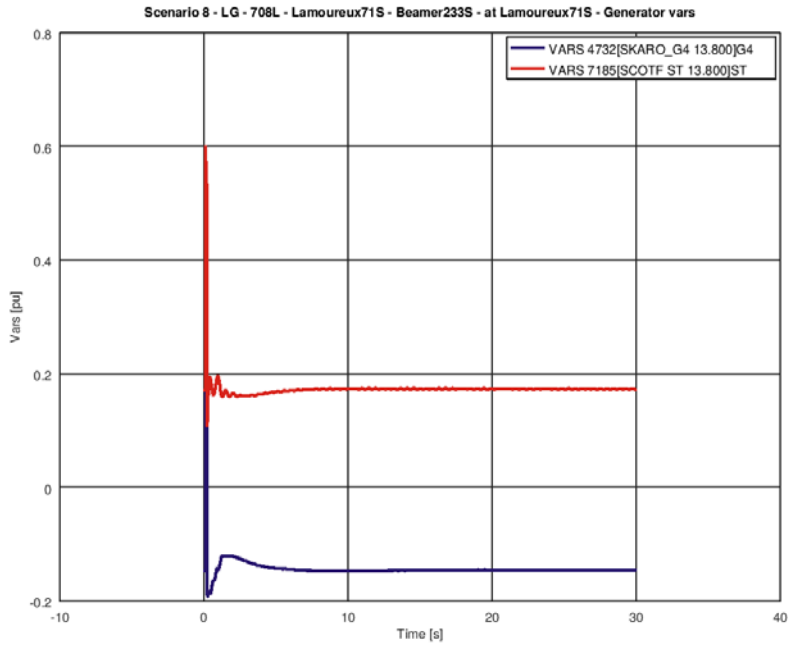


Figure A-1554 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Generator vars

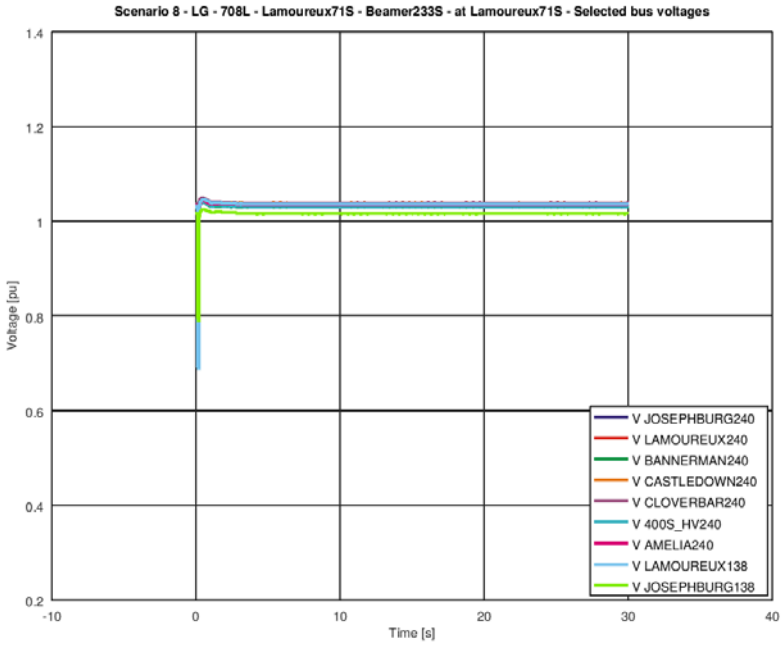


Figure A-1555 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

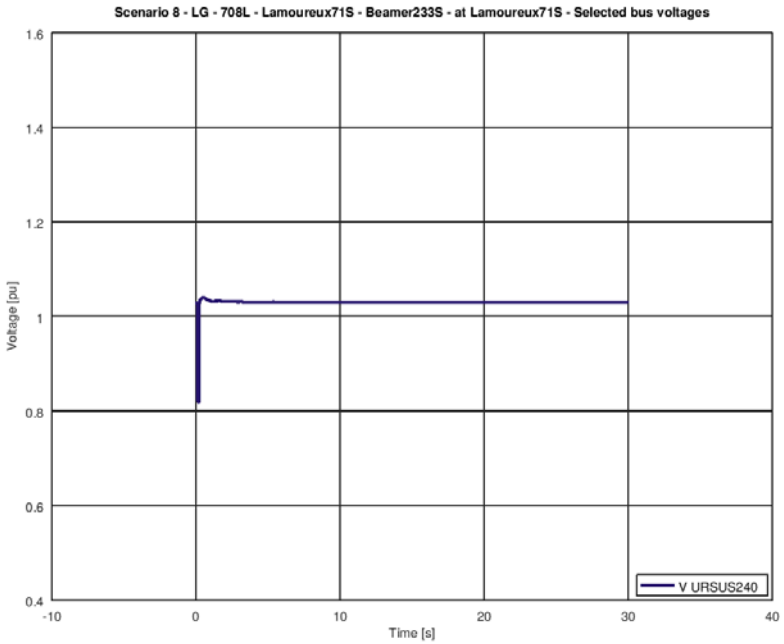


Figure A-1556 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected bus voltages

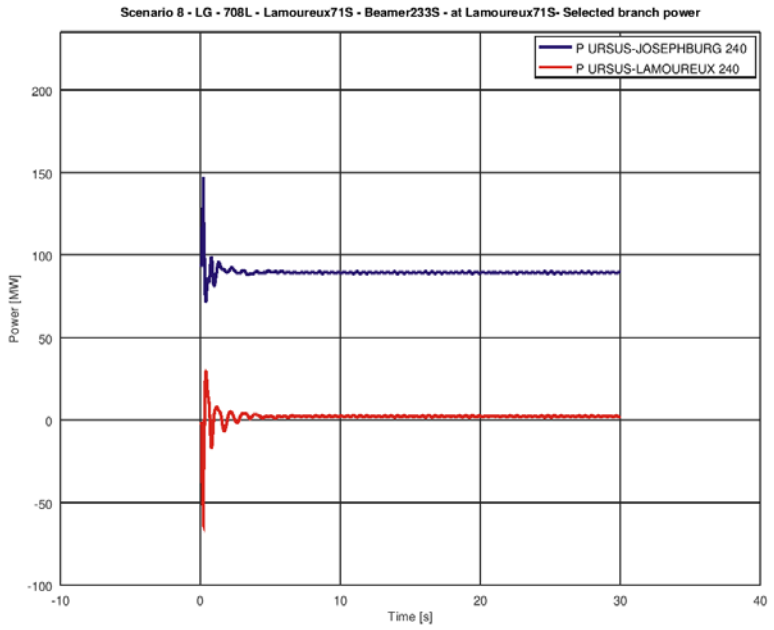


Figure A-1557 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch power

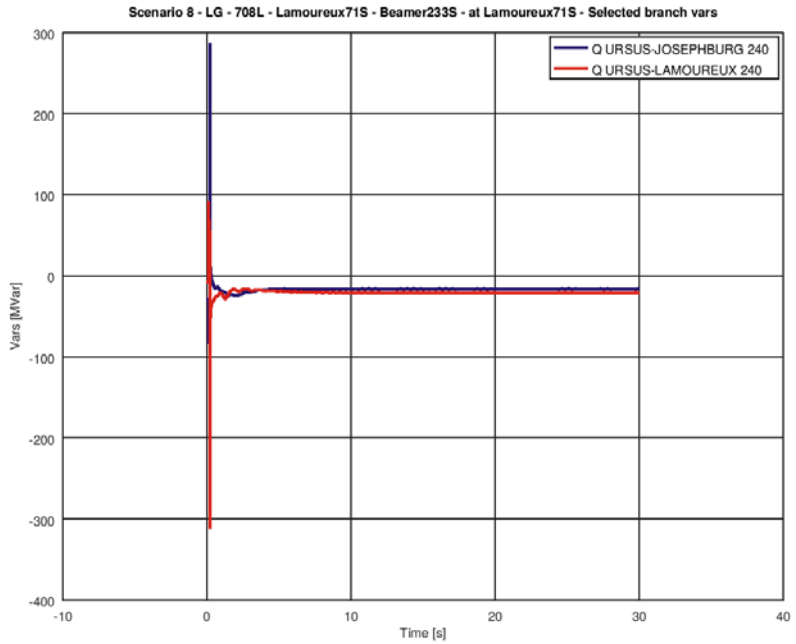


Figure A-1558 Scenario 8 - LG - 708L - Lamoureux71S - Beamer233S - at Lamoureux71S - Selected branch vars

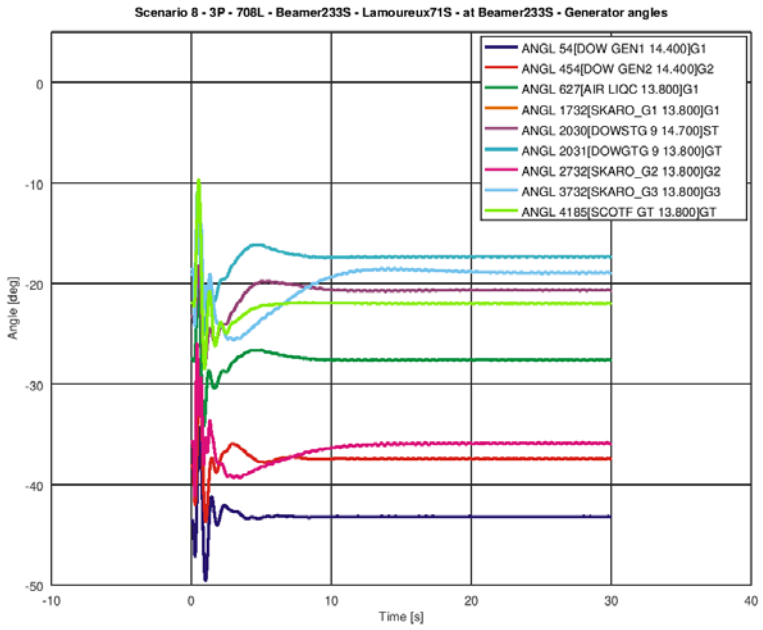


Figure A-1559 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

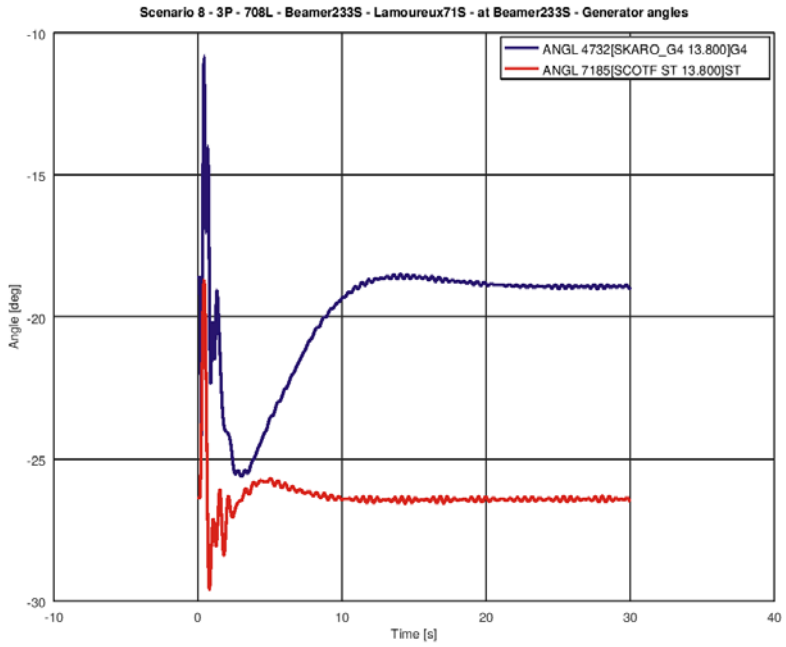


Figure A-1560 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

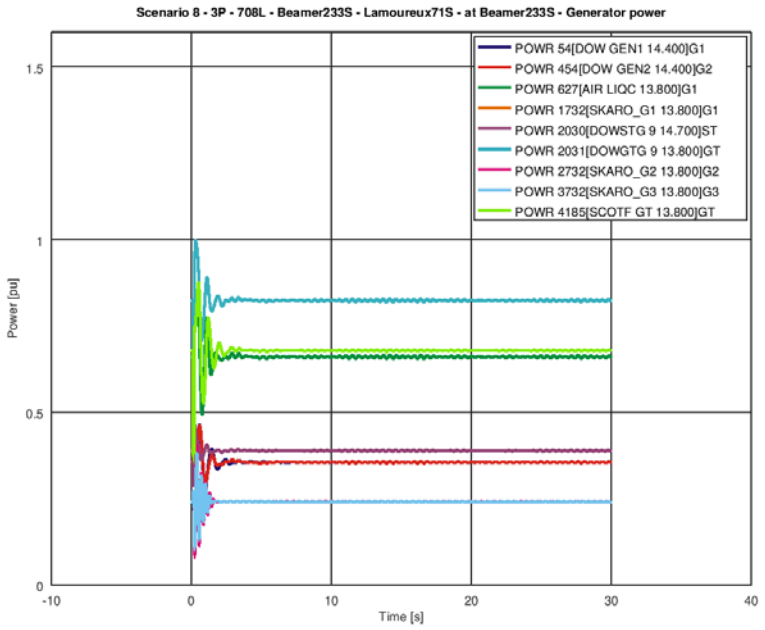


Figure A-1561 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

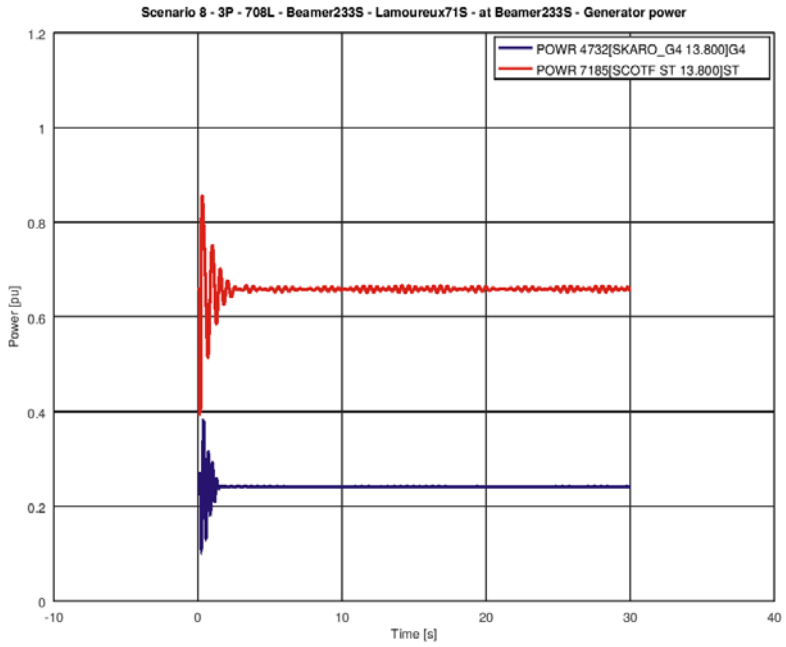


Figure A-1562 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

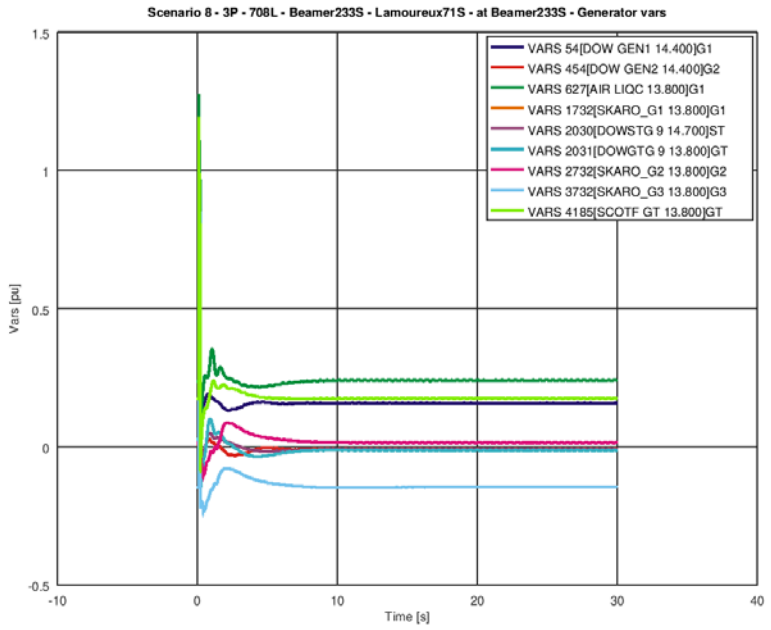


Figure A-1563 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

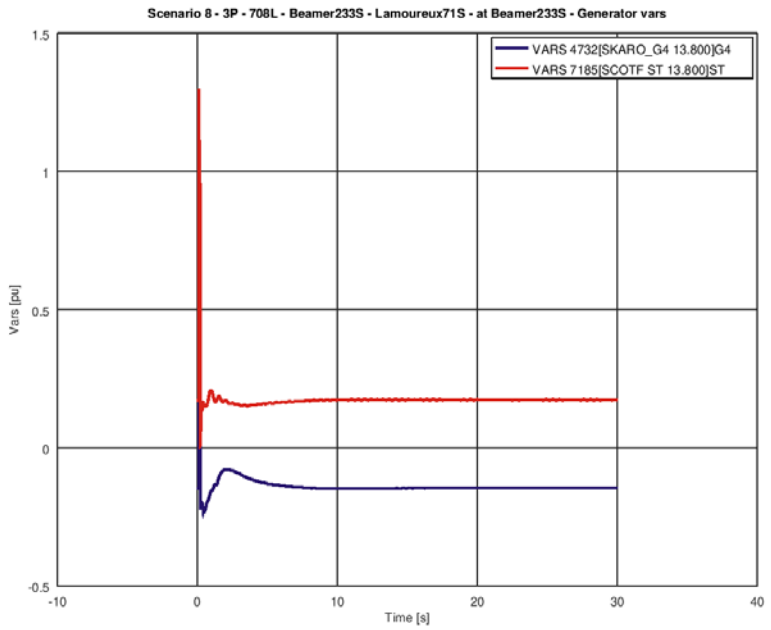


Figure A-1564 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

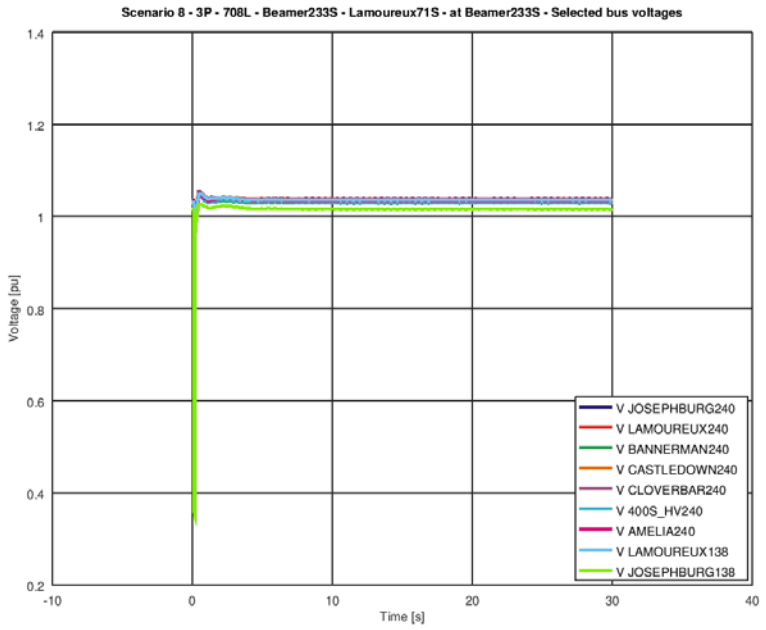


Figure A-1565 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

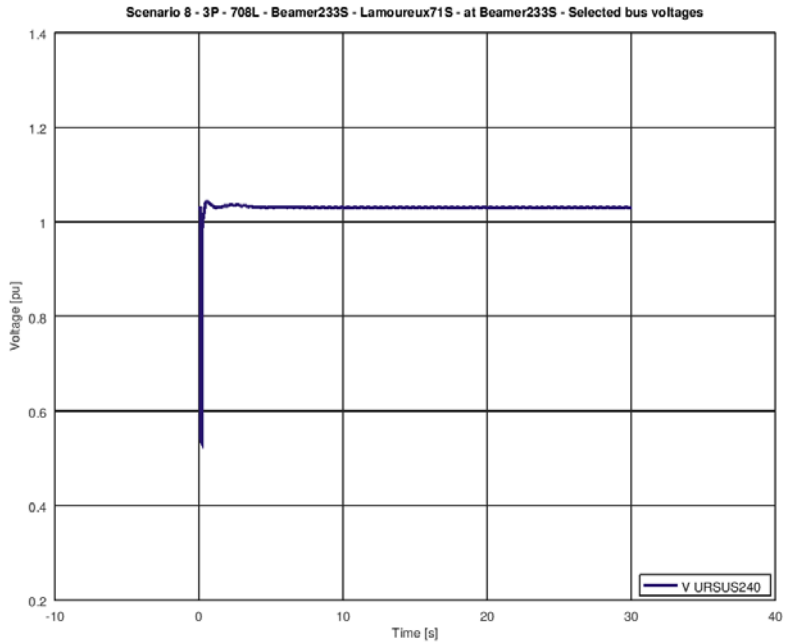


Figure A-1566 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

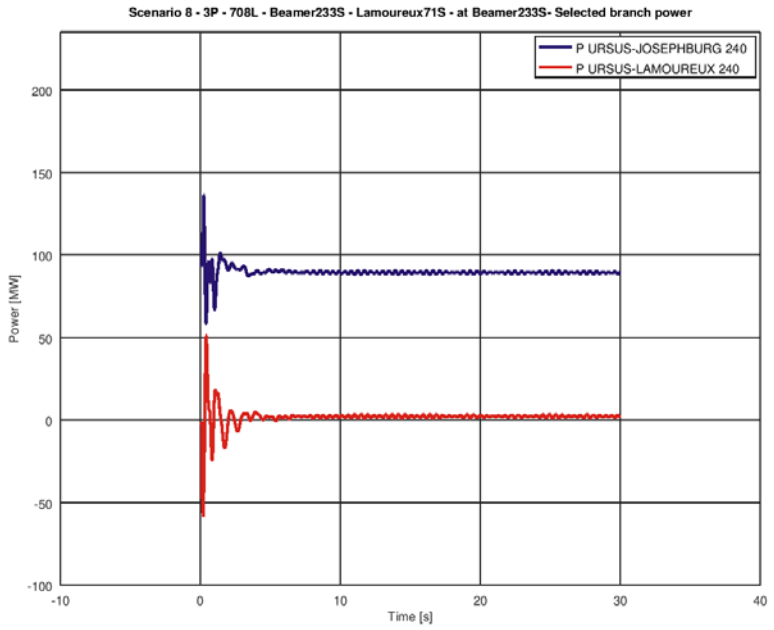


Figure A-1567 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

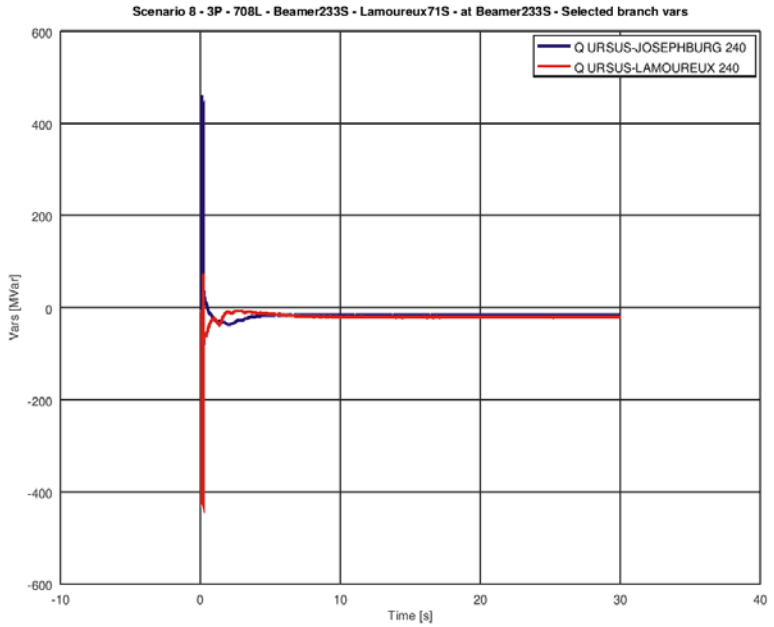


Figure A-1568 Scenario 8 - 3P - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

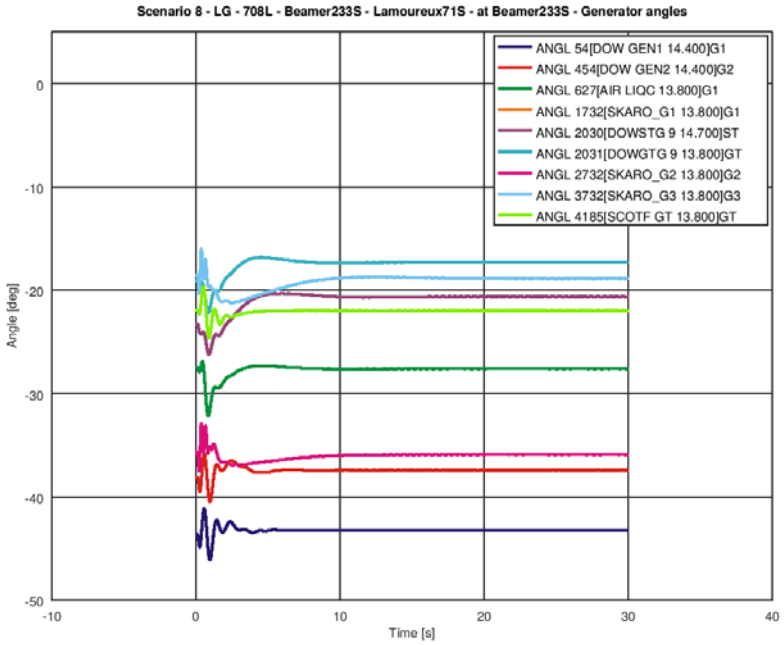


Figure A-1569 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

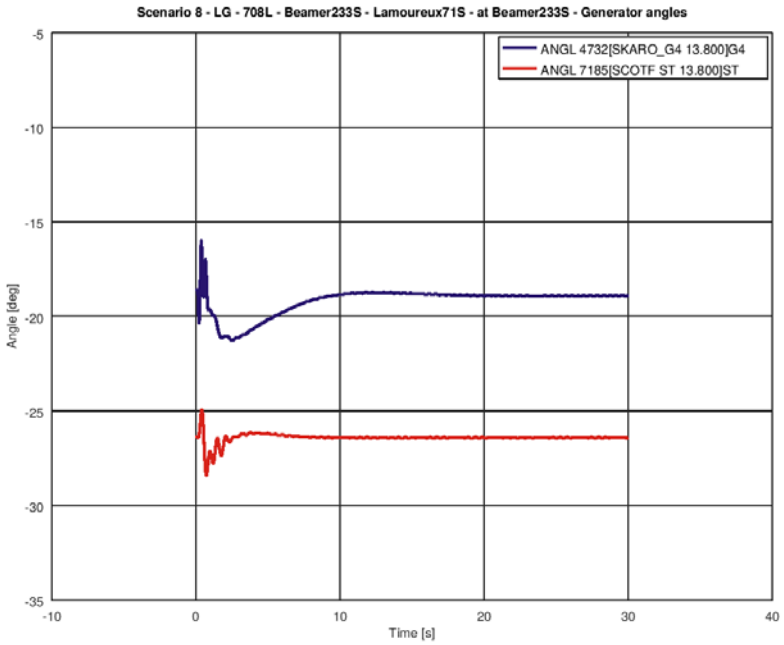


Figure A-1570 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator angles

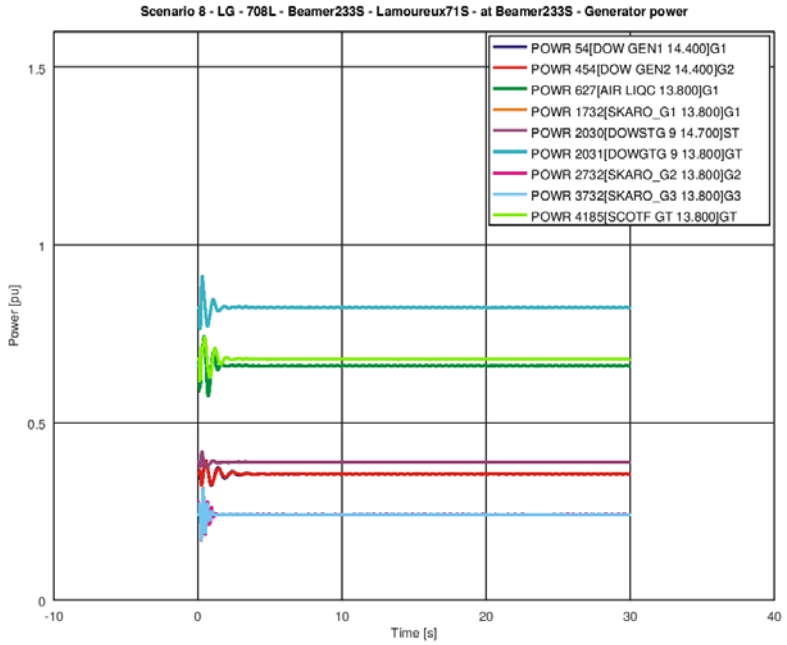


Figure A-1571 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

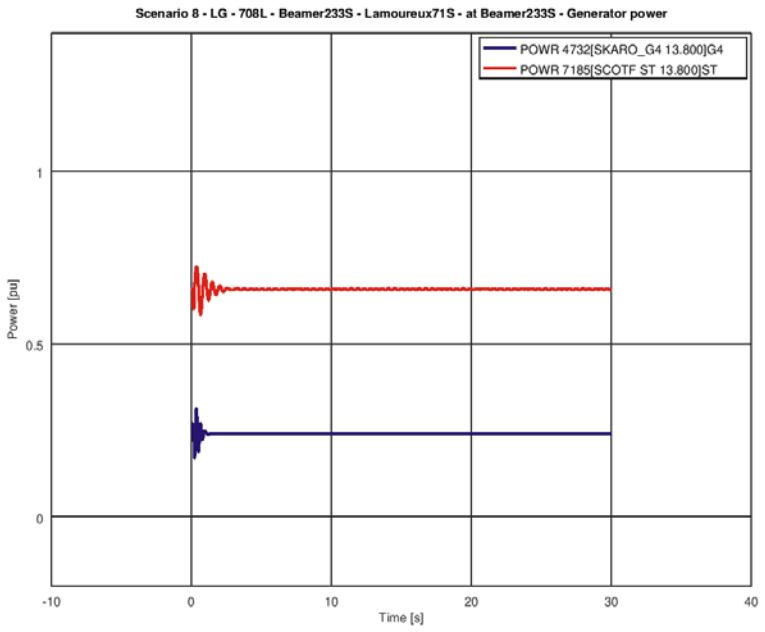


Figure A-1572 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator power

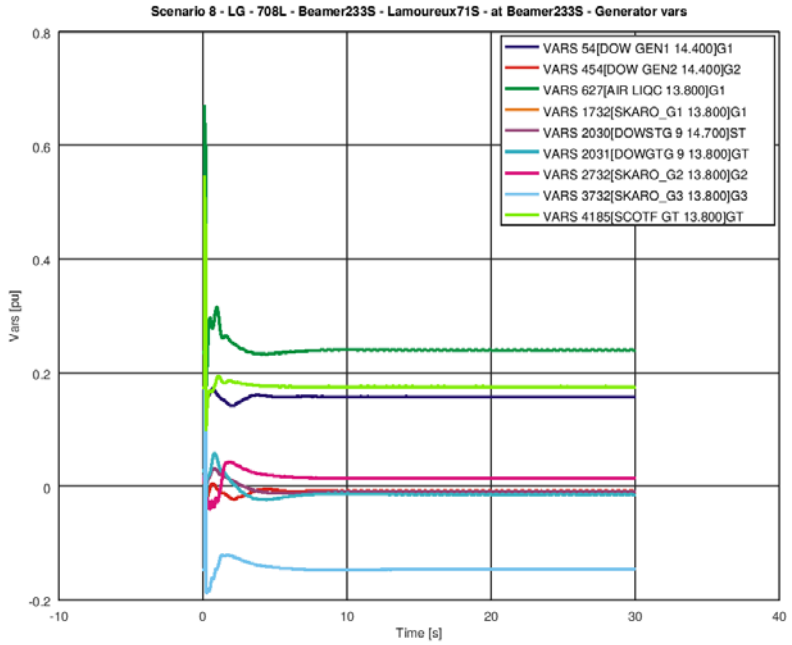


Figure A-1573 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

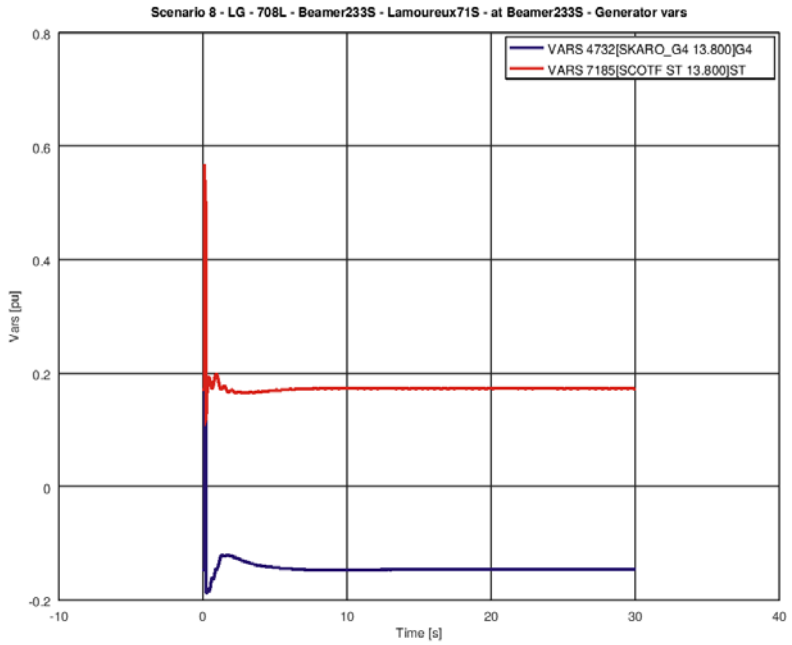


Figure A-1574 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Generator vars

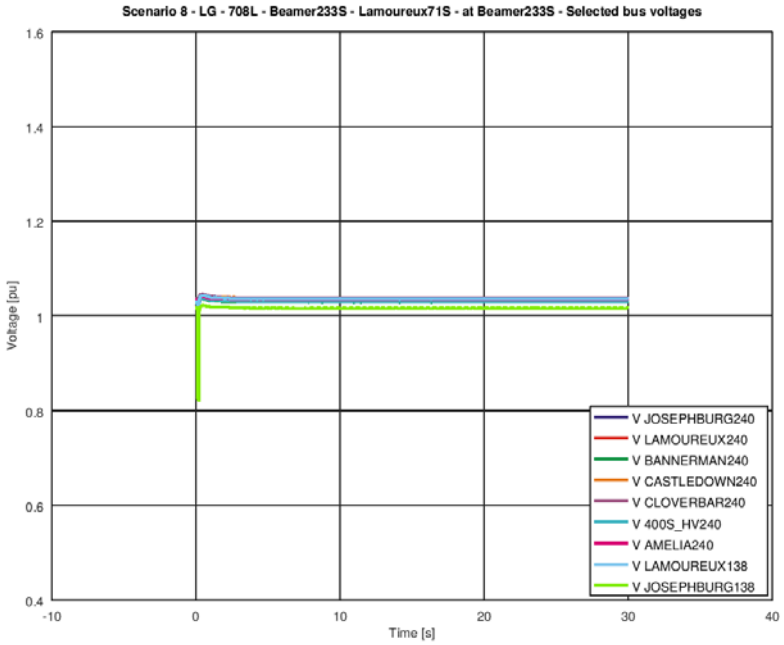


Figure A-1575 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

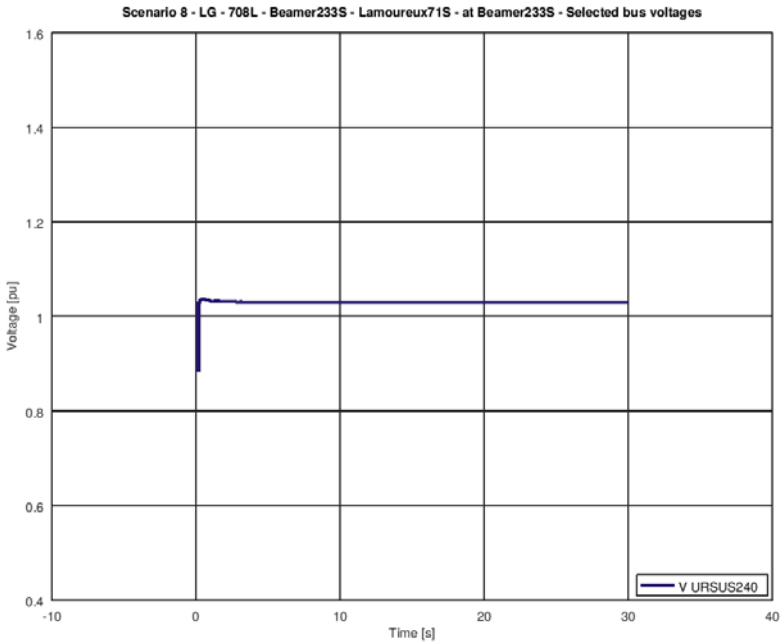


Figure A-1576 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected bus voltages

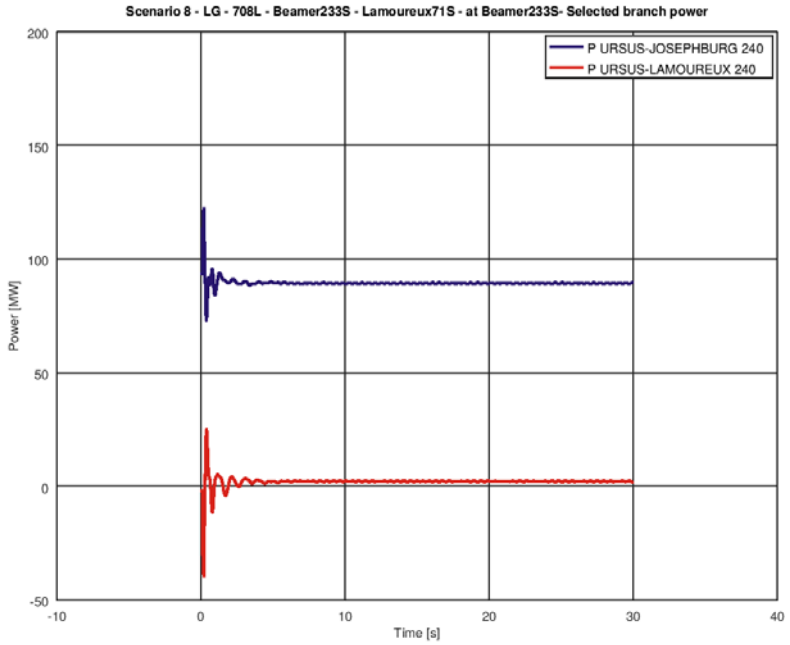


Figure A-1577 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch power

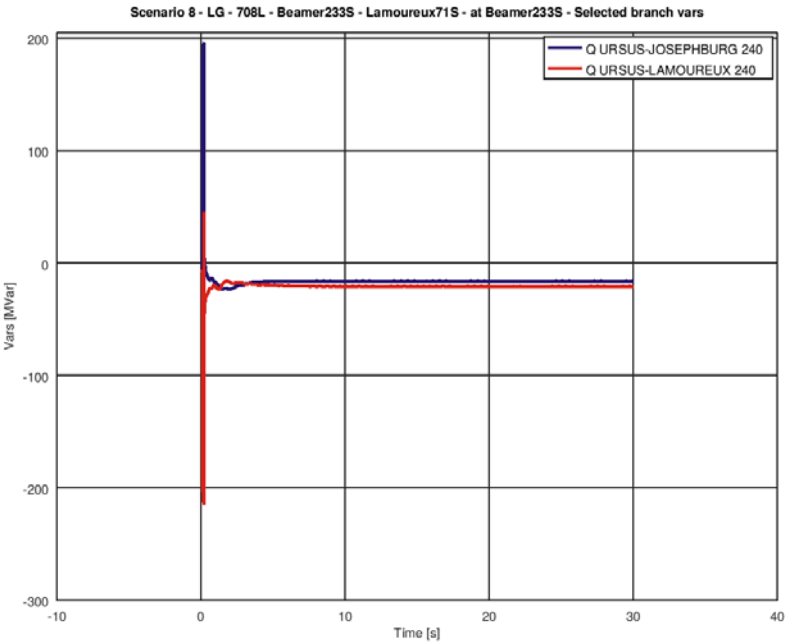


Figure A-1578 Scenario 8 - LG - 708L - Beamer233S - Lamoureux71S - at Beamer233S - Selected branch vars

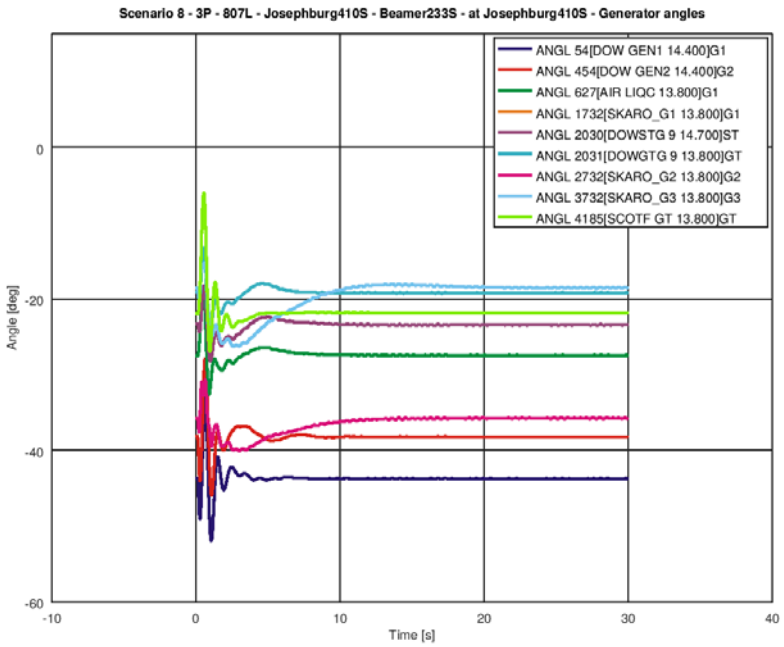


Figure A-1579 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

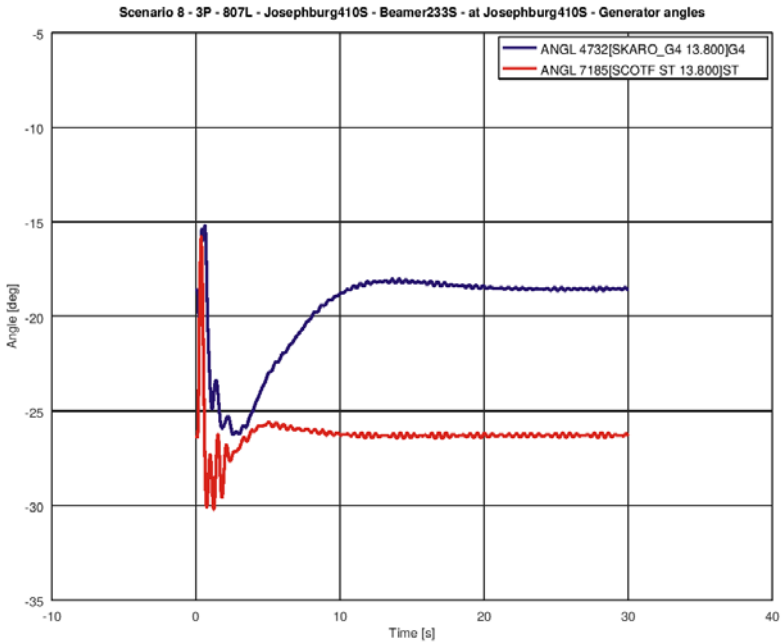


Figure A-1580 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

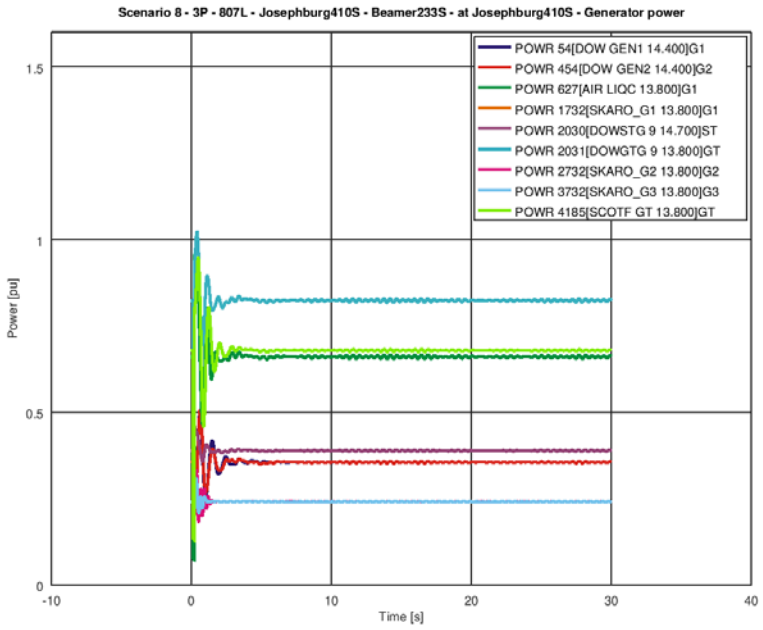


Figure A-1581 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

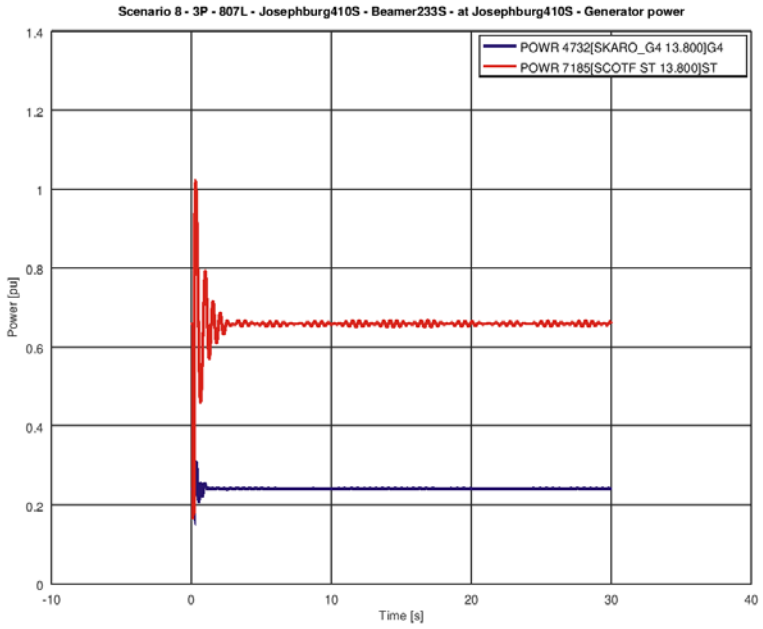


Figure A-1582 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

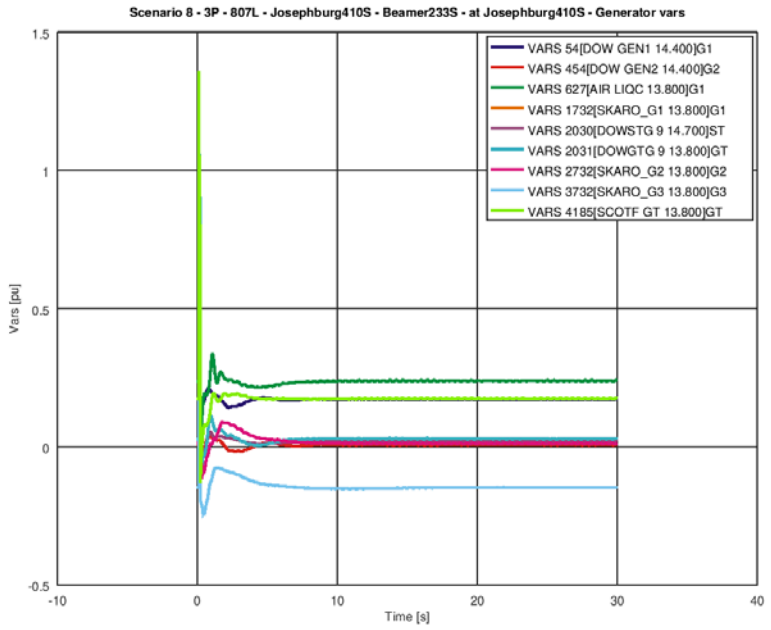


Figure A-1583 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

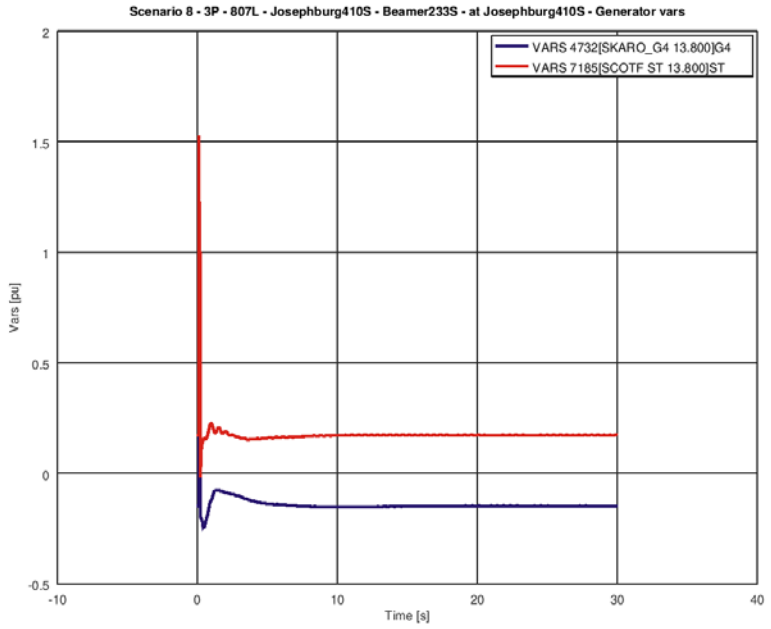


Figure A-1584 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

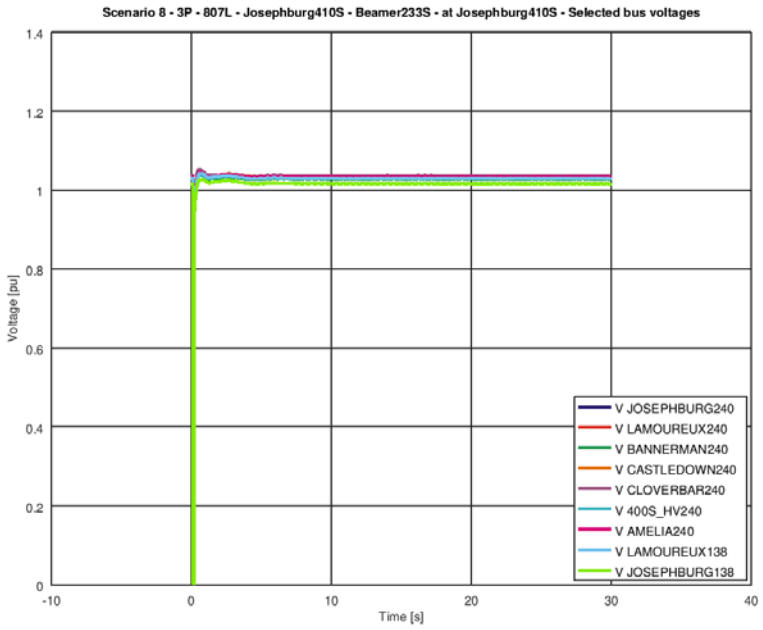


Figure A-1585 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

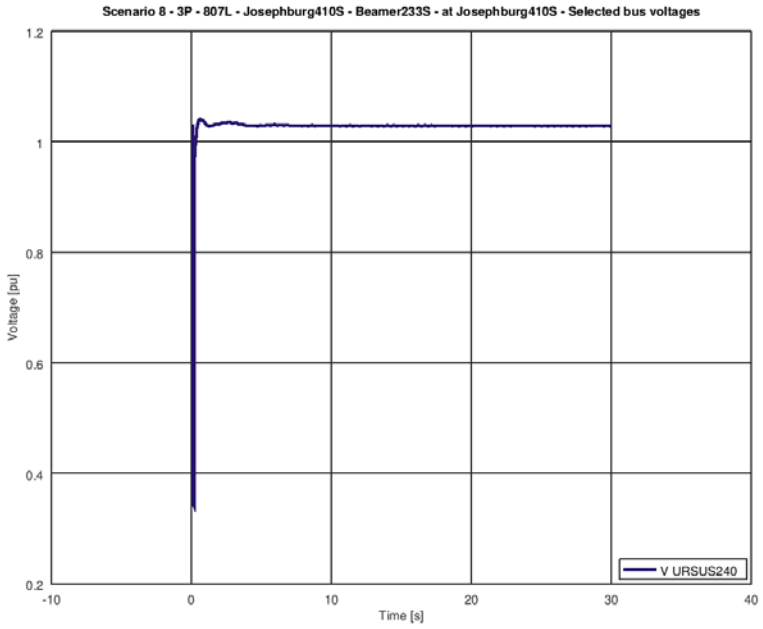


Figure A-1586 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

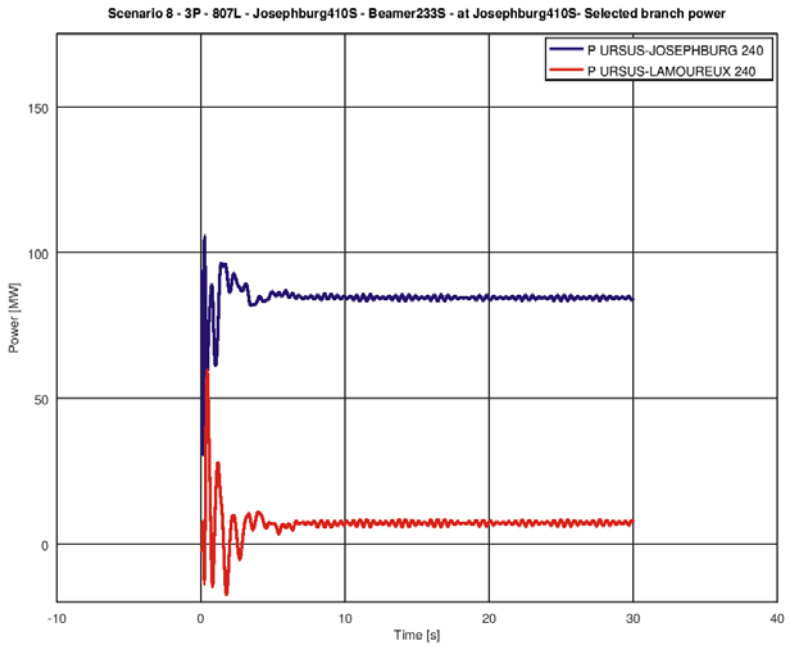


Figure A-1587 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

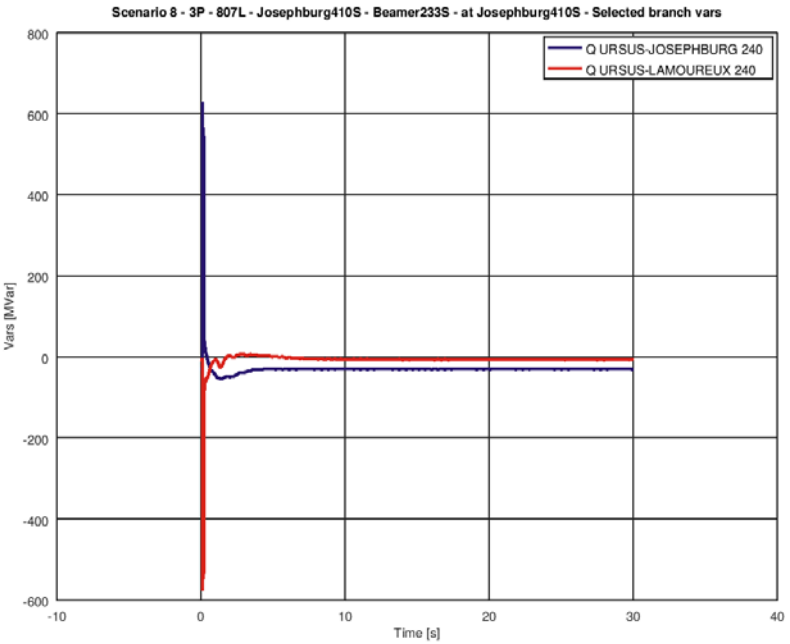


Figure A-1588 Scenario 8 - 3P - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

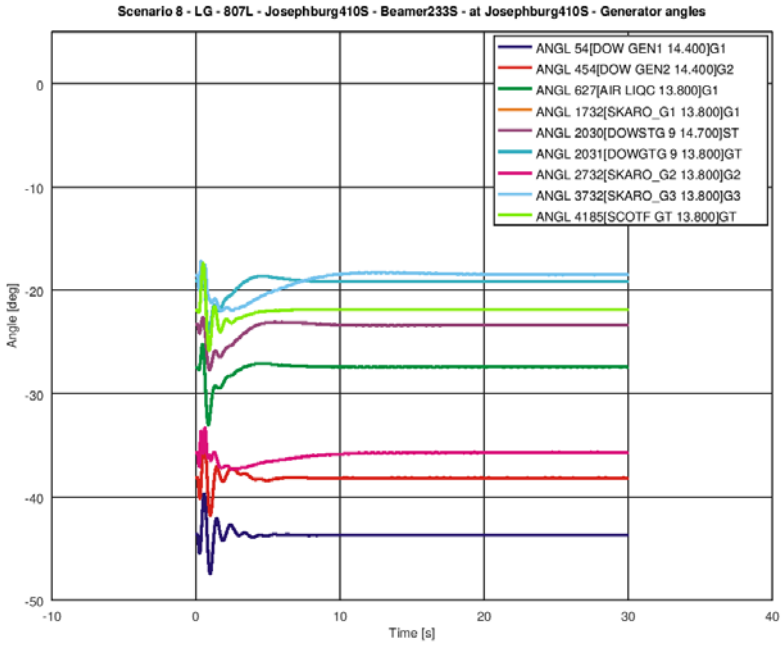


Figure A-1589 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

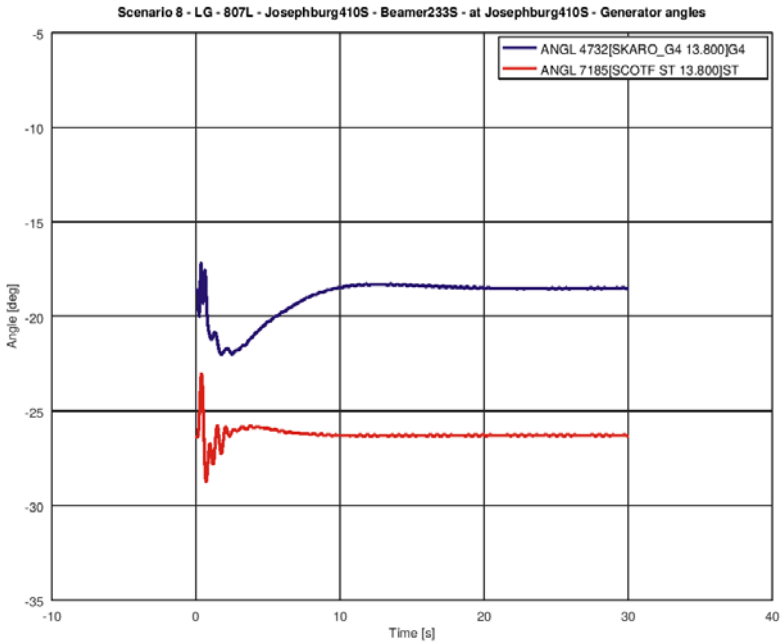


Figure A-1590 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator angles

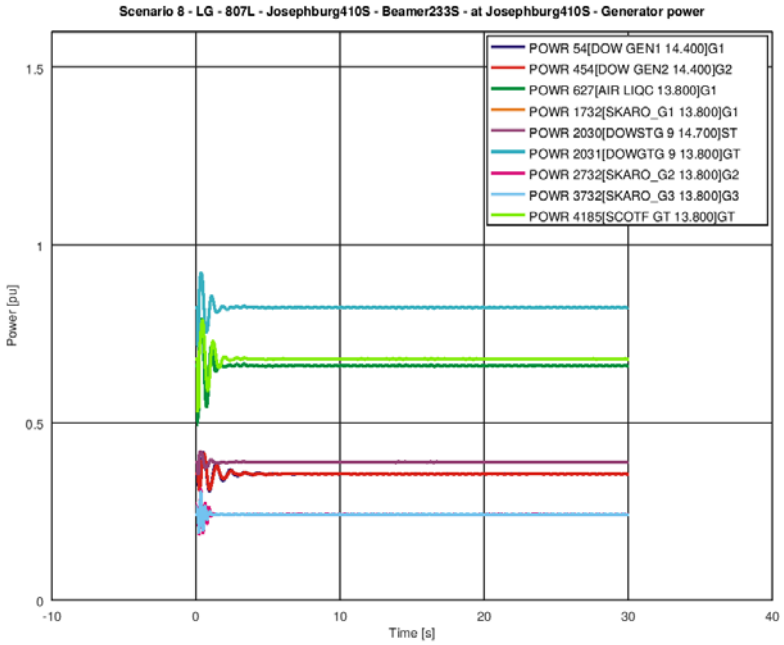


Figure A-1591 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

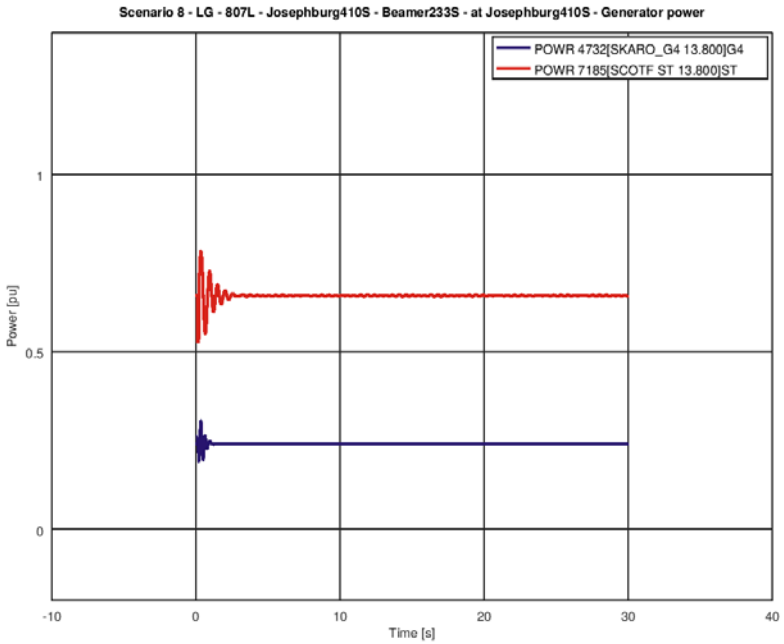


Figure A-1592 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator power

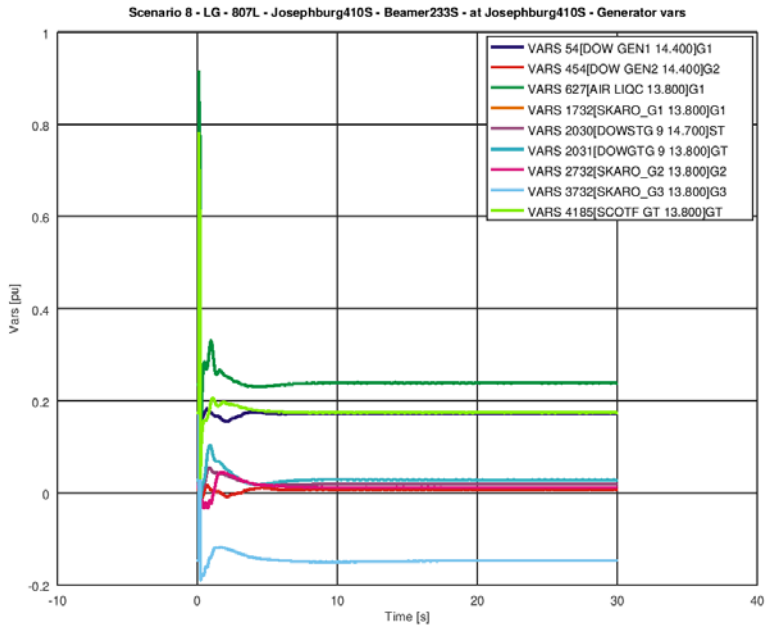


Figure A-1593 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

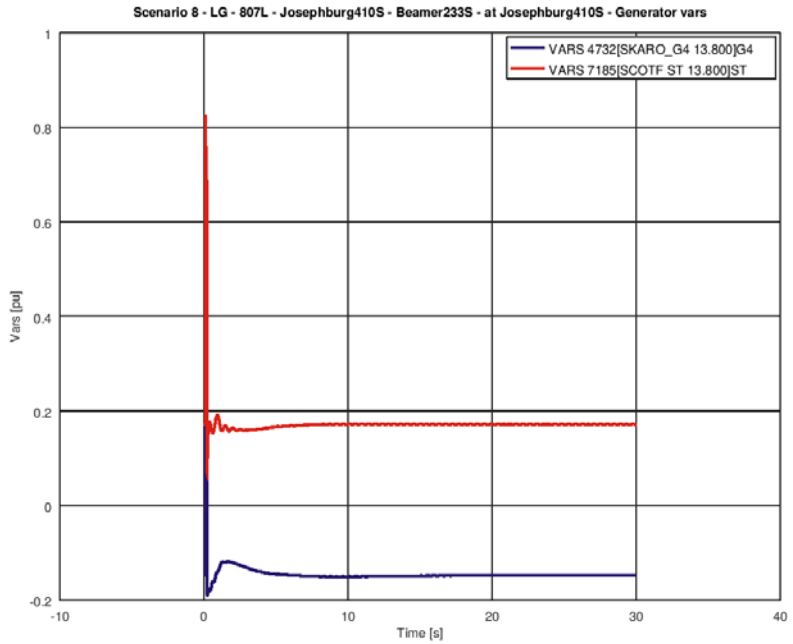


Figure A-1594 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Generator vars

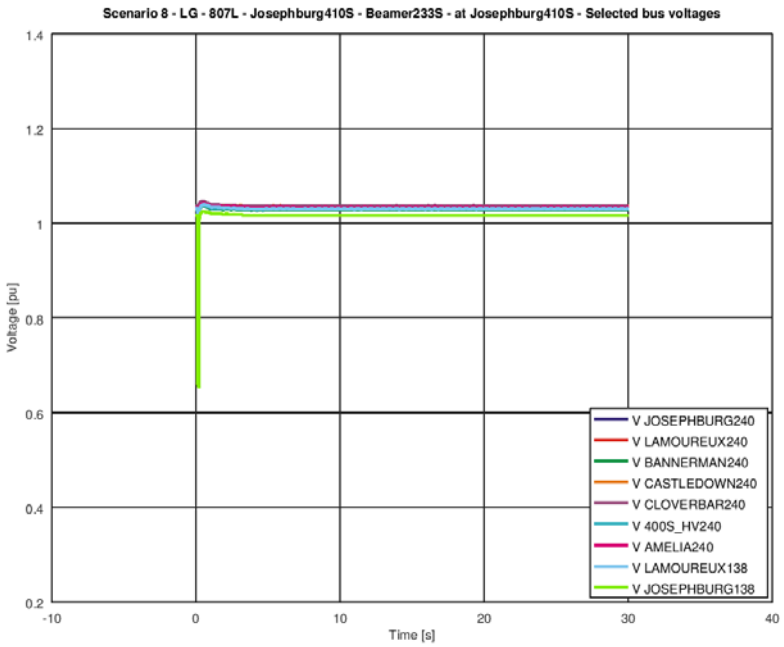


Figure A-1595 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

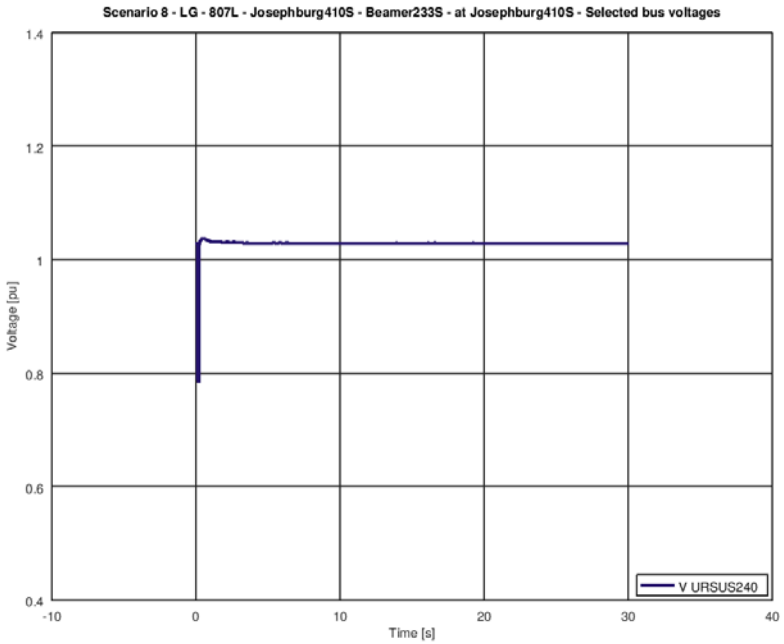


Figure A-1596 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected bus voltages

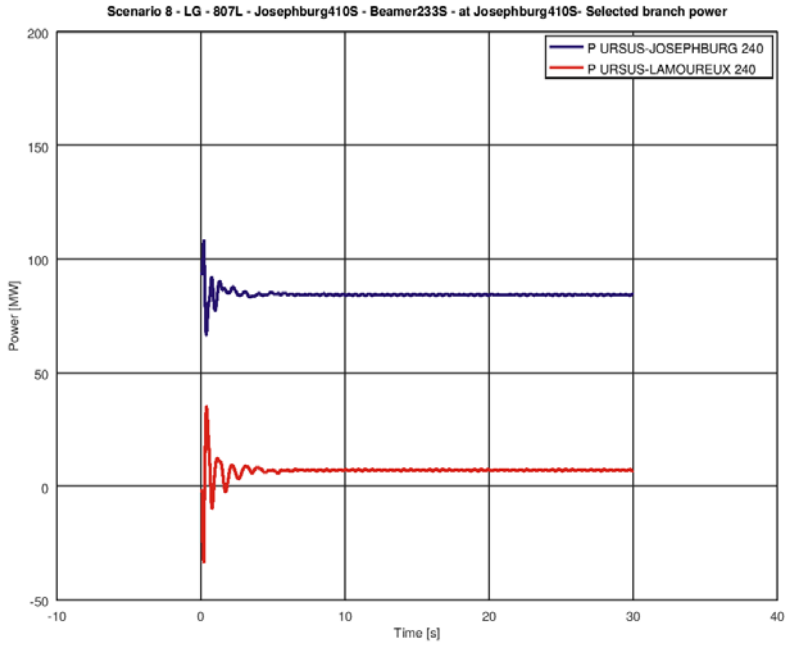


Figure A-1597 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch power

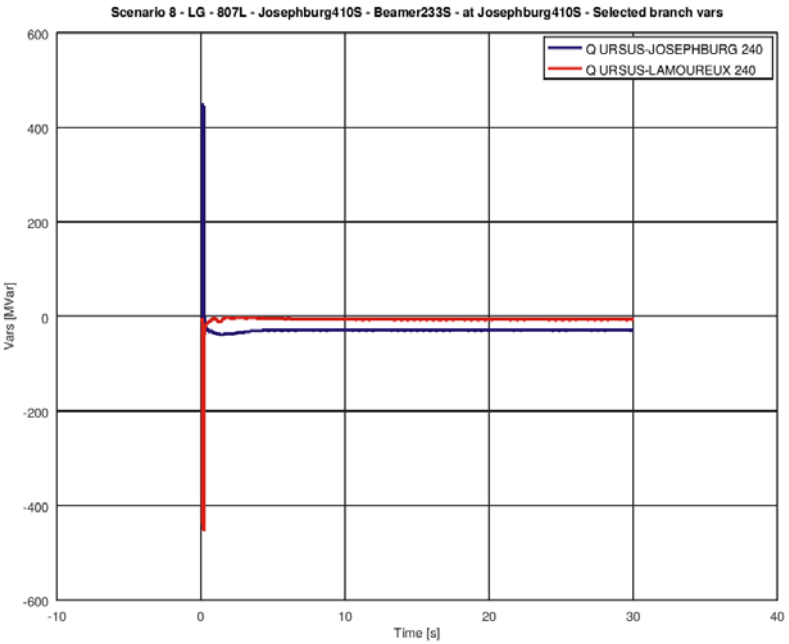


Figure A-1598 Scenario 8 - LG - 807L - Josephburg410S - Beamer233S - at Josephburg410S - Selected branch vars

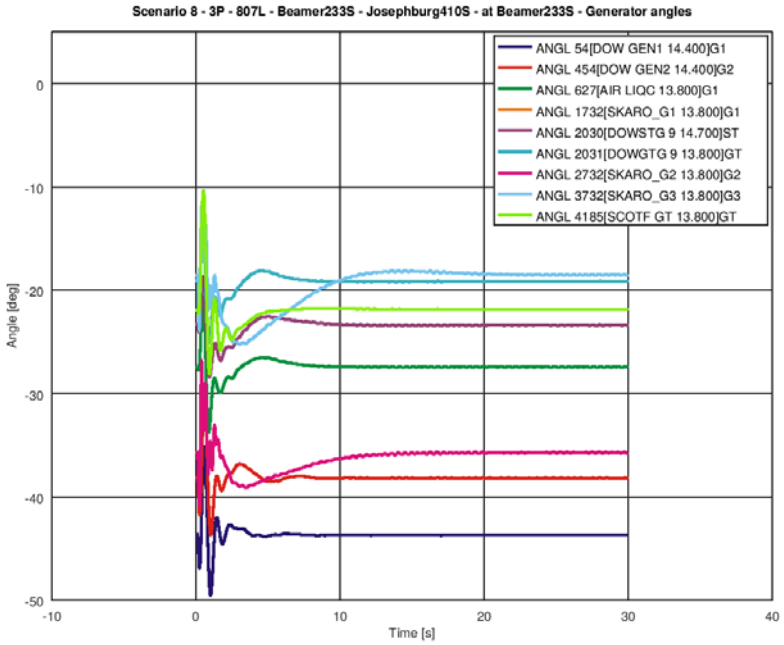


Figure A-1599 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

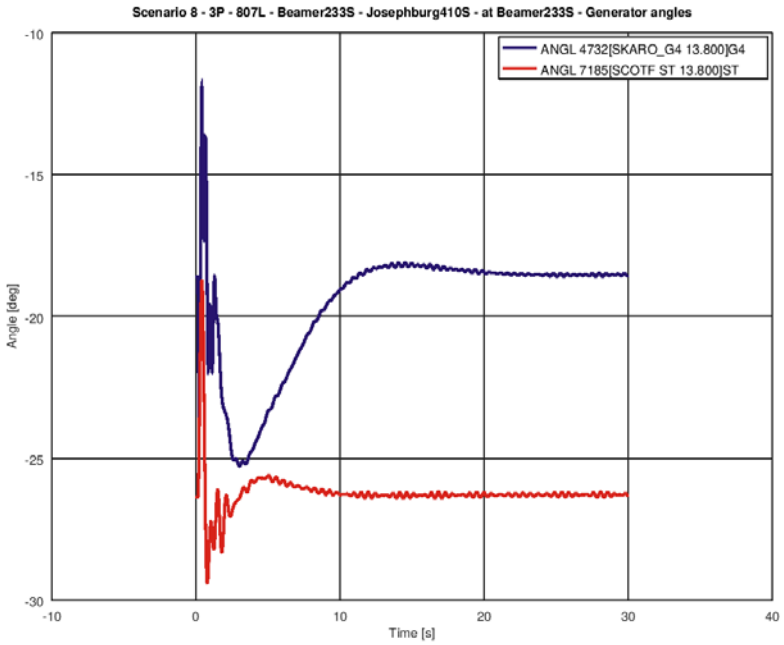


Figure A-1600 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

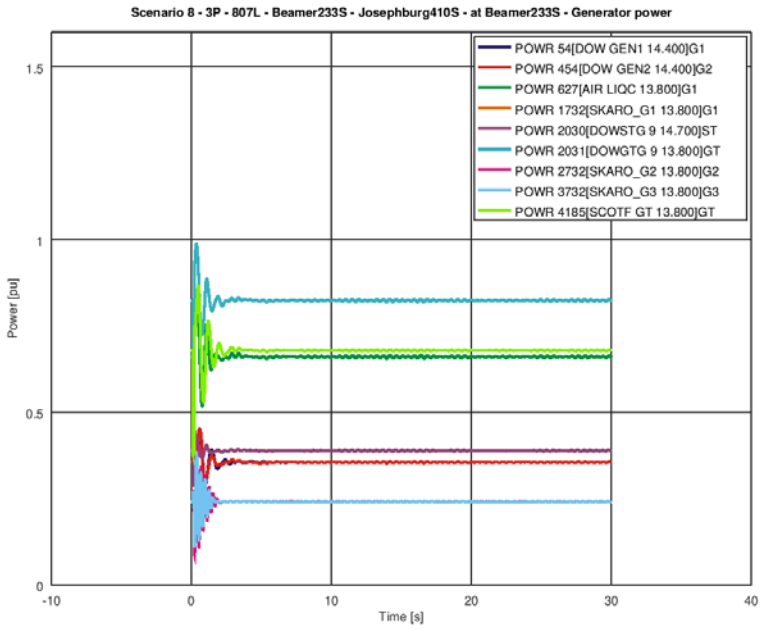


Figure A-1601 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

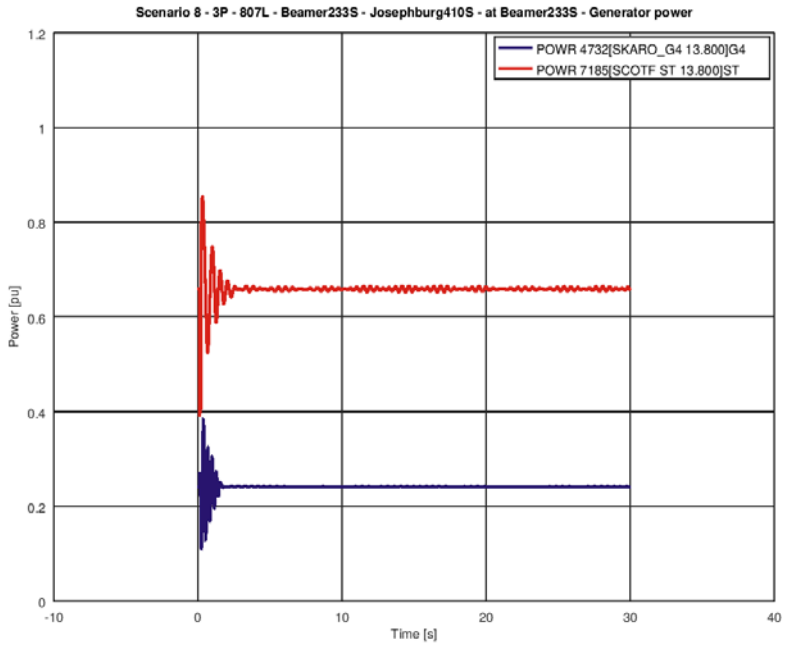


Figure A-1602 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

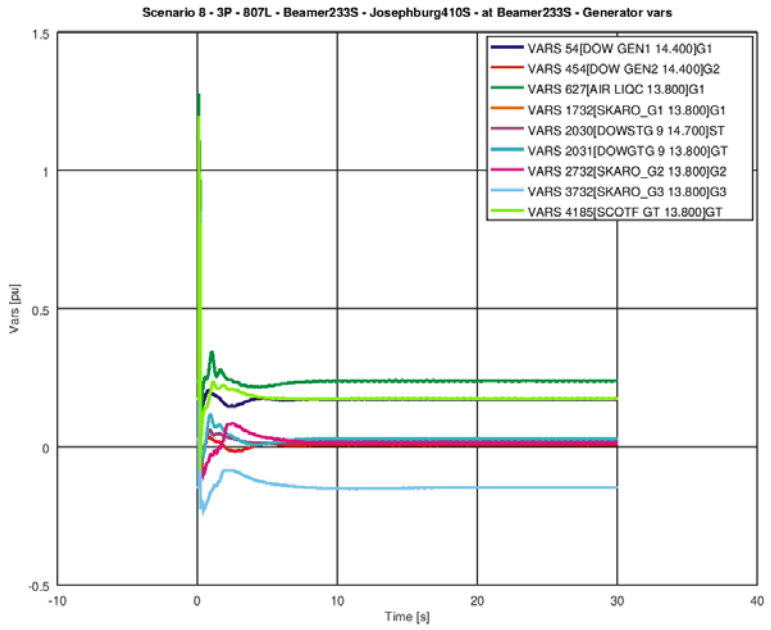


Figure A-1603 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

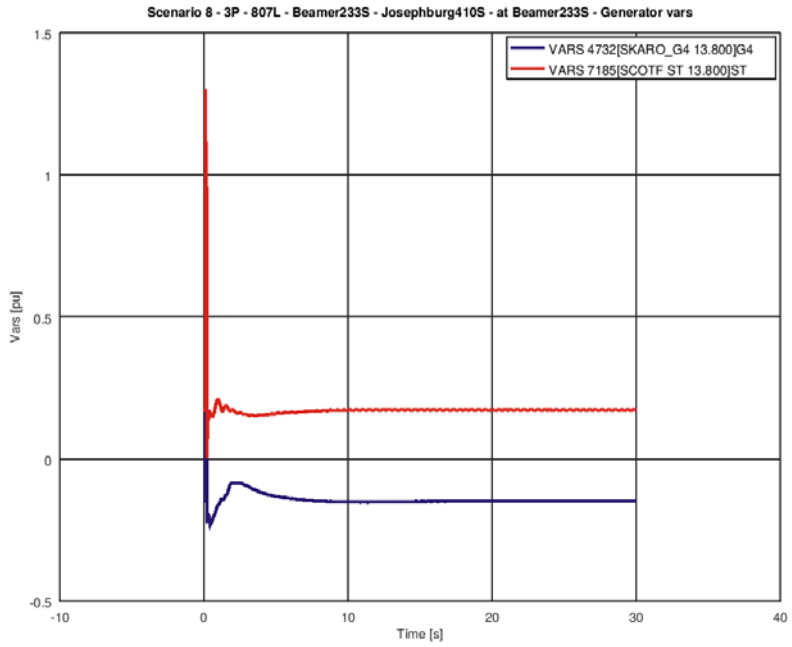


Figure A-1604 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

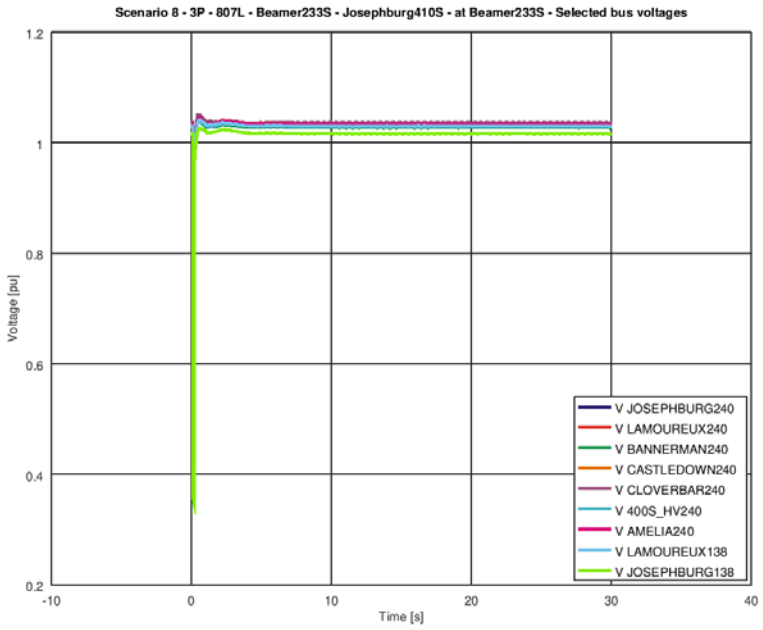


Figure A-1605 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

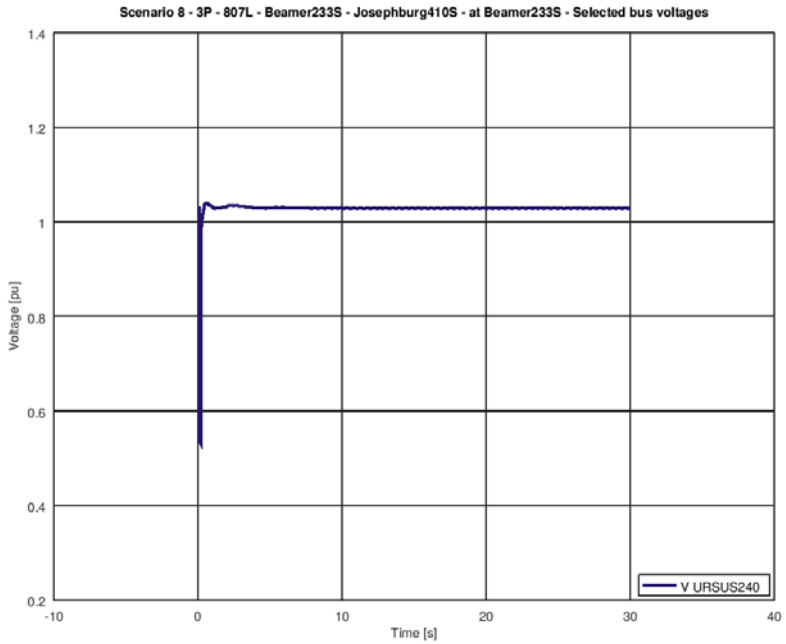


Figure A-1606 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

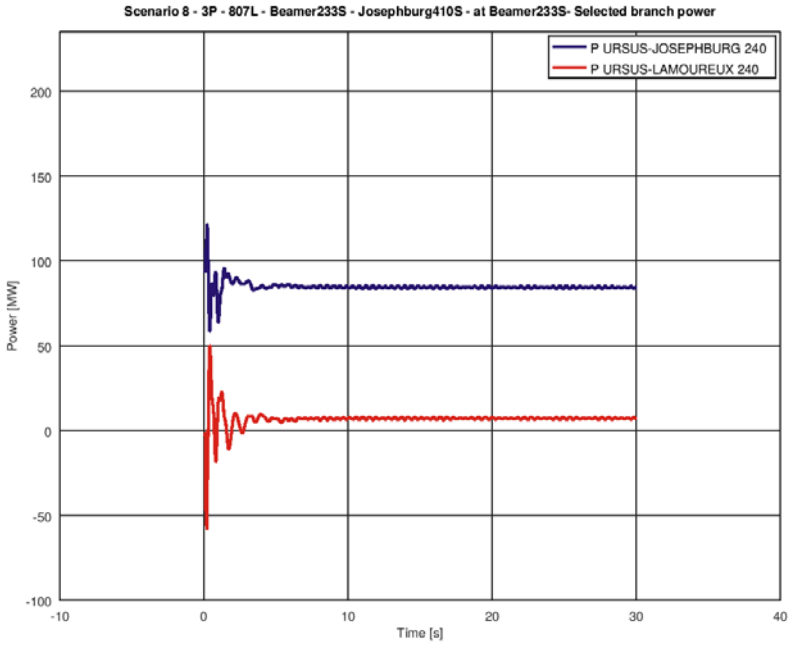


Figure A-1607 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

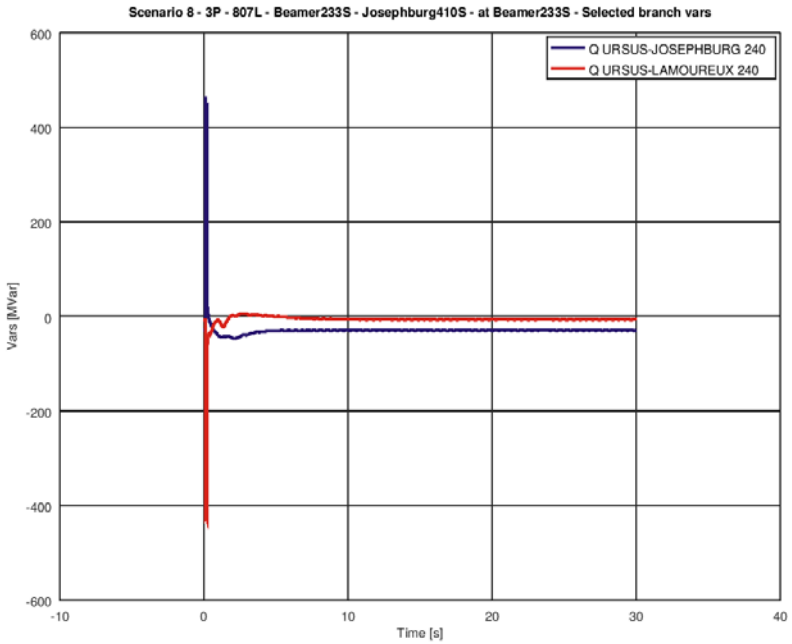


Figure A-1608 Scenario 8 - 3P - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

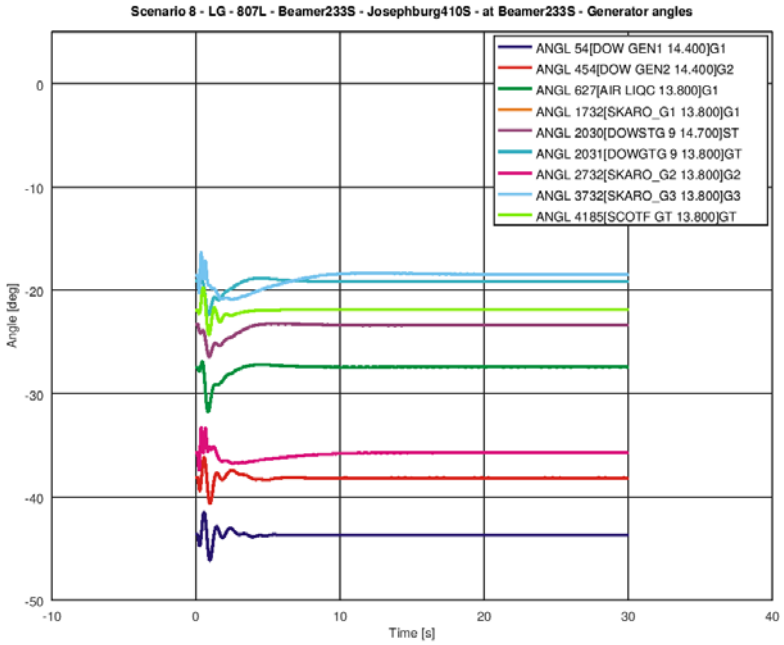


Figure A-1609 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

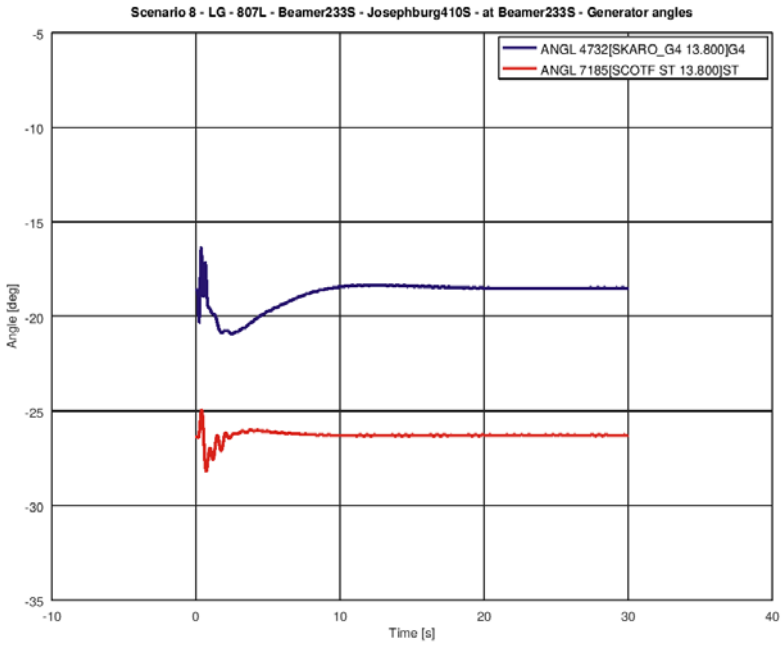


Figure A-1610 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator angles

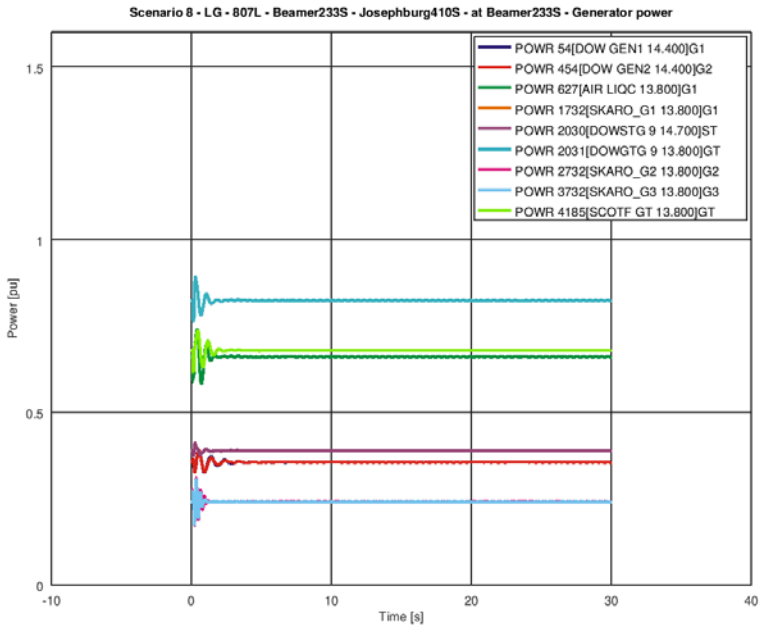


Figure A-1611 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

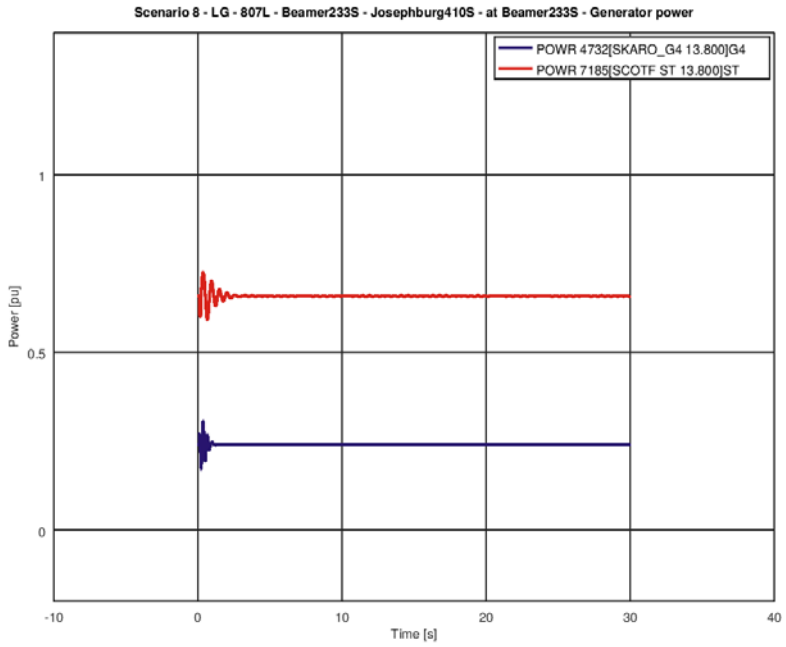


Figure A-1612 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator power

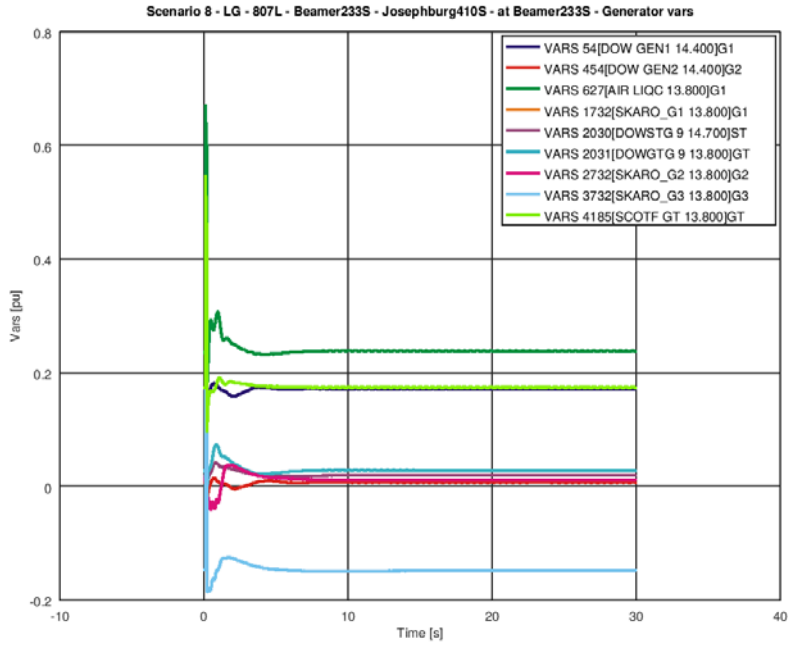


Figure A-1613 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

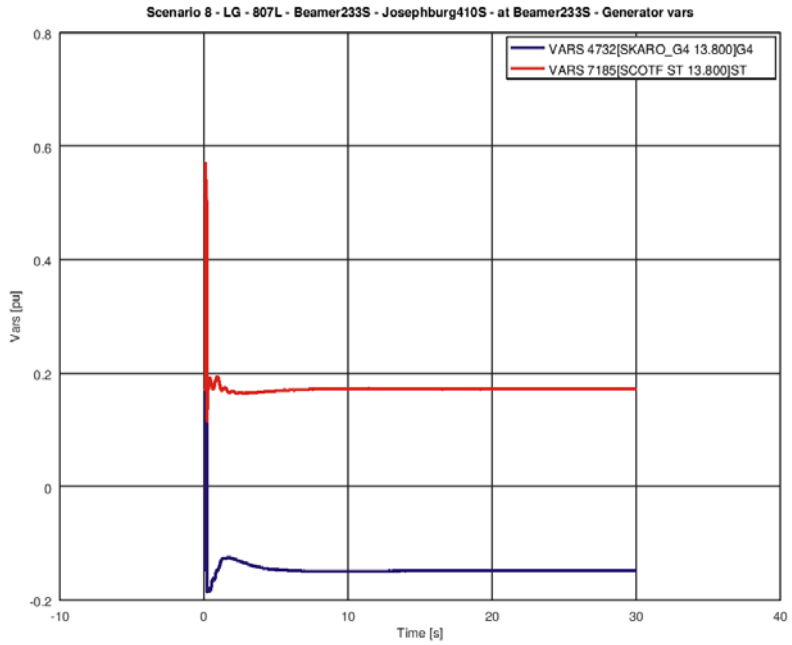


Figure A-1614 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Generator vars

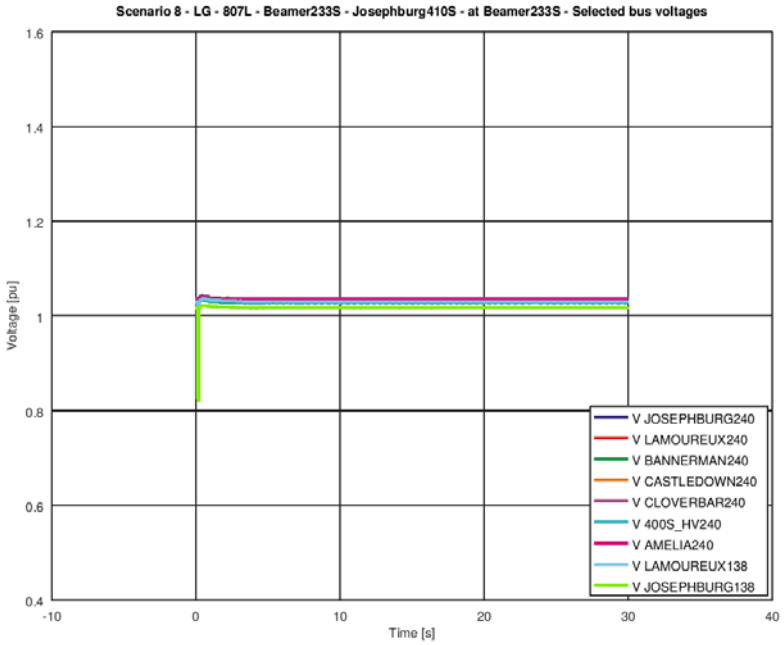


Figure A-1615 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

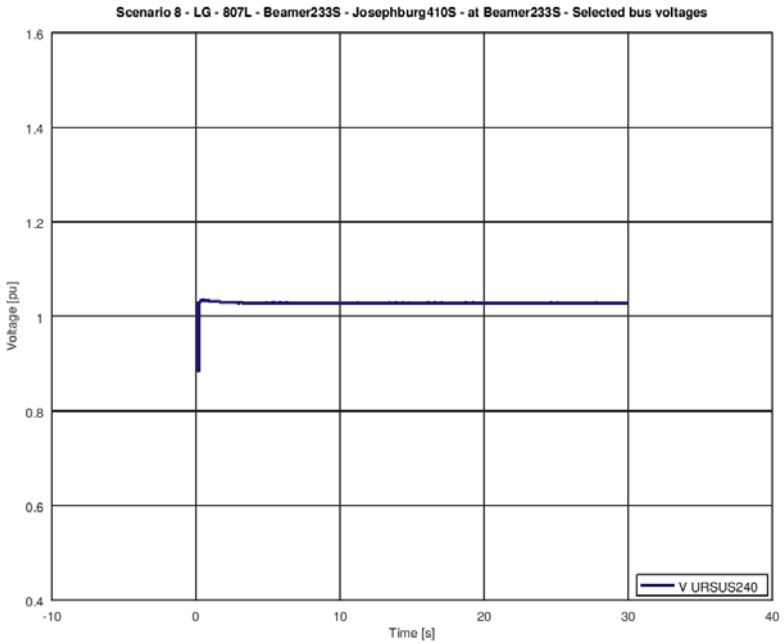


Figure A-1616 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected bus voltages

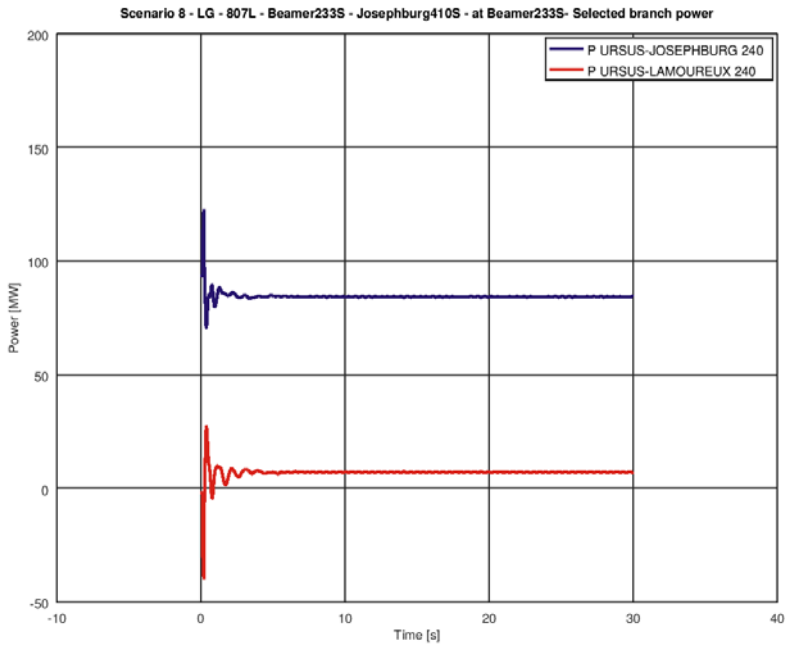


Figure A-1617 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch power

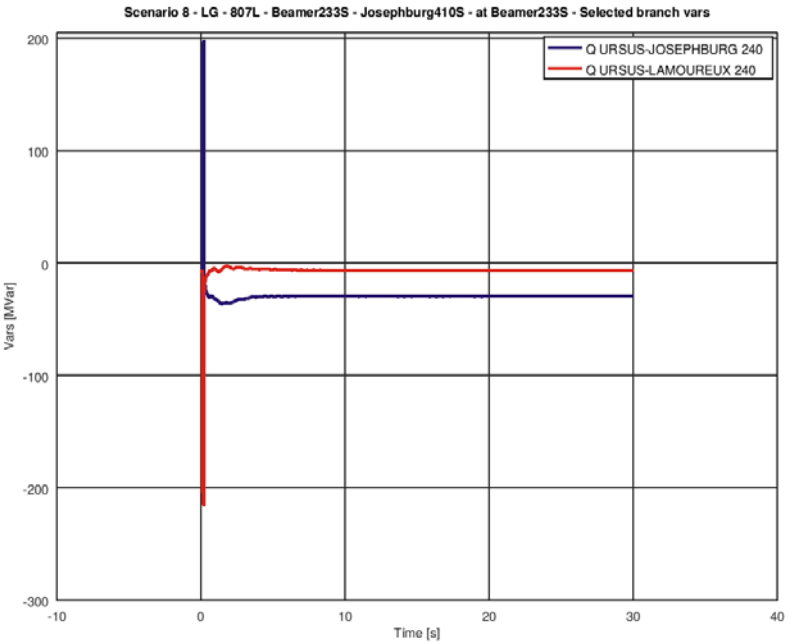


Figure A-1618 Scenario 8 - LG - 807L - Beamer233S - Josephburg410S - at Beamer233S - Selected branch vars

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Attachment A6
Dynamic Data and Assumptions

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The two generators in Ursus have identical parameters.

Table A-1 : Generator Model – GENTPJU1

CON	Value	Description
J	3.885	T'do (sec) , d-axis transient rotor time constant
J+1	0.026	T''d0 (sec) , d-axis sub-transient rotor time constant
J+2	0	T'q0 (sec) , q-axis transient rotor time constant
J+3	0.056	T''q0 (sec) , q-axis sub-transient rotor time constant
J+4	6.19	Inertia, H (>0) , Inertia constant
J+5	0	D (pu), Damping factor
J+6	1.883	Xd, d-axis synchronous reactance
J+7	1.228	Xq, q-axis synchronous reactance
J+8	0.469	X'd, d-axis transient reactance
J+9	1.228	X'q, q-axis transient reactance
J+10	0.267	X''d, d-axis sub-transient reactance
J+11	0.251	X''q, q-axis sub-transient reactance (set X''q = X''d)
J+12	0.169	Xl, stator leakage reactance
J+13	0.086087	S(1.0), saturation factor at 1 pu flux
J+14	0.21841	S(1.2) , saturation factor at 1.2 pu flux
J+15	0.08	Kis (0 < Kis <1), current multiplier for saturation calculation

Table A-2 : Voltage Compensator – COMP

CON	Value	Description
J	-0.04	Xe (machine base)

Table A-3 : Excitation Model – AC8B

CON	Value	Description
J	0.02	TR (sec) regulator input filter time constant

J+1	25	KPR (pu) regulator proportional gain
J+2	11	KIR (pu) regulator integral gain
J+3	12	KDR (pu) regulator derivative gain
J+4	0.2	TDR (sec) regulator derivative block time constant
J+5	7.763	VPIDMAX (pu) PID maximum limit
J+6	0.1553	VPIDMIN (pu) PID minimum limit
J+7	1	KA (pu) voltage regulator proportional gain
J+8	0	TA (sec) voltage regulator time constant
J+9	12.243	VRMAX (pu) regulator output maximum limit
J+10	0	VRMIN (pu) regulator output minimum limit
J+11	0.211	KC (pu) rectifier loading factor proportional to commutating reactance
J+12	1.427	KD (pu) demagnetizing factor, function of AC exciter reactances
J+13	1	KE (pu) exciter constant related fo self-excited field
J+14	0.78	TE (pu) exciter time constant (>0)
J+15	13.47	VFEMAX (pu) exciter field current limit (> 0)
J+16	0	VEMIN (pu)
J+17	6.6	E1
J+18	0.046	S(E1)
J+19	4.2	E2
J+20	0.046	S(E2)

Table A-4 : Governor Model – GGOV1

ICON	Value	Description
M		Rselect, Feedback signal for governor droop: 1 electrical power 0 none (isochronous governor) -1 fuel valve stroke (true stroke) -2 governor output (requested stroke)
M+1		Flag Switch for fuel source characteristic: 0 fuel flow independent of speed 1 fuel flow proportional to speed
CON	**Value**	**Description**
J	0.06	R, Permanent droop, pu

J+1	1	Tpelec, Electrical power transducer time constant, sec
J+2	0.2	maxerr, Maximum value for speed error signal
J+3	-0.2	minerr, Minimum value for speed error signal
J+4	5.3	Kpgov, Governor proportional gain
J+5	0.5	Kigov, Governor integral gain
J+6	4.9	Kdgov, Governor derivative gain
J+7	1	Tdgov, Governor derivative controller time constant, sec
J+8	0.645	vmax, Maximum valve position limit
J+9	0.09	vmin, Minimum valve position limit
J+10	0.2	Tact, Actuator time constant, sec
J+11	2.103	Kturb, Turbine gain
J+12	0.17	Wfnl, No load fuel flow, pu
J+13	0.1	Tb, Turbine lag time constant, sec
J+14	0	Tc, Turbine lead time constant, sec
J+15	0	Teng, Transport lag time constant for diesel engine, sec
J+16	0	Tfload, Load Limiter time constant, sec
J+17	10	Kpload, Load limiter proportional gain for PI controller
J+18	0	Kiload, Load limiter integral gain for PI controller
J+19	2	Ldref, Load limiter reference value pu
J+20	0	Dm, Mechanical damping coefficient, pu
J+21	3.3	Ropen, Maximum valve opening rate, pu/sec
J+22	-3.3	Rclose, Maximum valve closing rate, pu/sec
J+23	0	Kimw, Power controller (reset) gain
J+24	1	Aset, Acceleration limiter setpoint, pu/sec
J+25	10	Ka, Acceleration limiter gain
J+26	0	Ta, Acceleration limiter time constant, sec (> 0)
J+27	50.5	Trate, Turbine rating (MW)1
J+28	0	db, Speed governor deadband
J+29	0	Tsa, Temperature detection lead time constant, sec
J+30	0	Tsb, Temperature detection lag time constant, sec
J+31	1	Rup, Maximum rate of load limit increase
J+32	-1	Rdown, Maximum rate of load limit decrease