APPENDIX A CONNECTION ASSESSMENT

Engineering Connection Assessment

P2122 Cypress Wind Power Project Connection

Cypress Renewable Energy Centre LP.

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Role	Name	Date	Signature
Prepared	Payam Zamani, PhD, P. Eng.	March 9, 2020	
Reviewed	Siavash Zoroofi, PhD, P. Eng.	March 9, 2020	
Approved	Maz Mazadi, PhD, P. Eng.	March 9, 2020	

PROFESSIONAL ENGINEER ALBERTA
PAYAM ZAMANIDEHKORDI
2020-03-09

APEGA
Permit-to-Practice
P-8200
2020-03-16

Alberta Electric System Operator

Calgary Place, 2500, 330 - 5th Avenue SW Calgary, AB T2P 0L4

Phone: 403-539-2450 | Fax: 403-539-2949

www.aeso.ca

@theaeso

NOTE:

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

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

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1 Introduction

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

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

1.1 Project Overview

Cypress Renewable Energy Centre LP. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its approved Cypress Wind Power Project (Facility) to the AIES. The Facility includes an approved collector station, designated as the Woolchester 1019S substation. The Facility is planned to be located in the Dunmore area, in the AESO planning area of Medicine Hat (Area 4).

The Market Participant's request includes: a request for a new system access service in the area, with a Rate STS, *Supply Transmission Service*, contract capacity of 201.6 MW, and a Rate DTS, *Demand Transmission Service*, contract capacity of 2.7 MW, and a request for transmission development (collectively, the Project).

The scheduled in-service date (ISD) for the Project is November 1, 2021.

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 legal owner of a transmission facility (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 Medicine Hat (Area 4) which is part of the AESO South Planning Region. Medicine Hat (Area 4) is surrounded by the planning areas of Brooks (Area 47), Empress (Area 48), and Vauxhall (Area 52).

From a transmission system perspective, Medicine Hat (Area 4) consists primarily of 240 kV and 138 kV transmission systems. Medicine Hat (Area 4) is connected to the AESO planning area of Brooks (Area 47) through the 240 kV transmission lines 1034L and 1035L and 138 kV transmission line 100L, connected to the AESO planning area of Empress (Area 48) through the 138 kV transmission line 658L, and connected to the AESO planning area of Vauxhall (Area 52) through the 138 kV transmission line 879L.

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

2.3 Study Area

The Study Area for the Project consists of the AESO Planning areas of Medicine Hat (Area 4), Brooks (Area 47), Empress (Area 48), and Vauxhall (Area 52), including the tie lines connecting these planning areas to the rest of the AIES. All transmission facilities within the Study Area will be studied and monitored for violations of the Reliability Criteria (defined in Section 3.1 of Attachment A1).

3 Connection Alternatives

3.1 Overview

The AESO, in consultation with the TFO in the Study Area and the Market Participant, examined two (2) transmission alternatives to meet the Market Participant's request for system access service, as detailed in Section 3.2.

3.2 Connection Alternatives Examined

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

Alternative 1 – T-tap connection to the 240 kV transmission line 983L

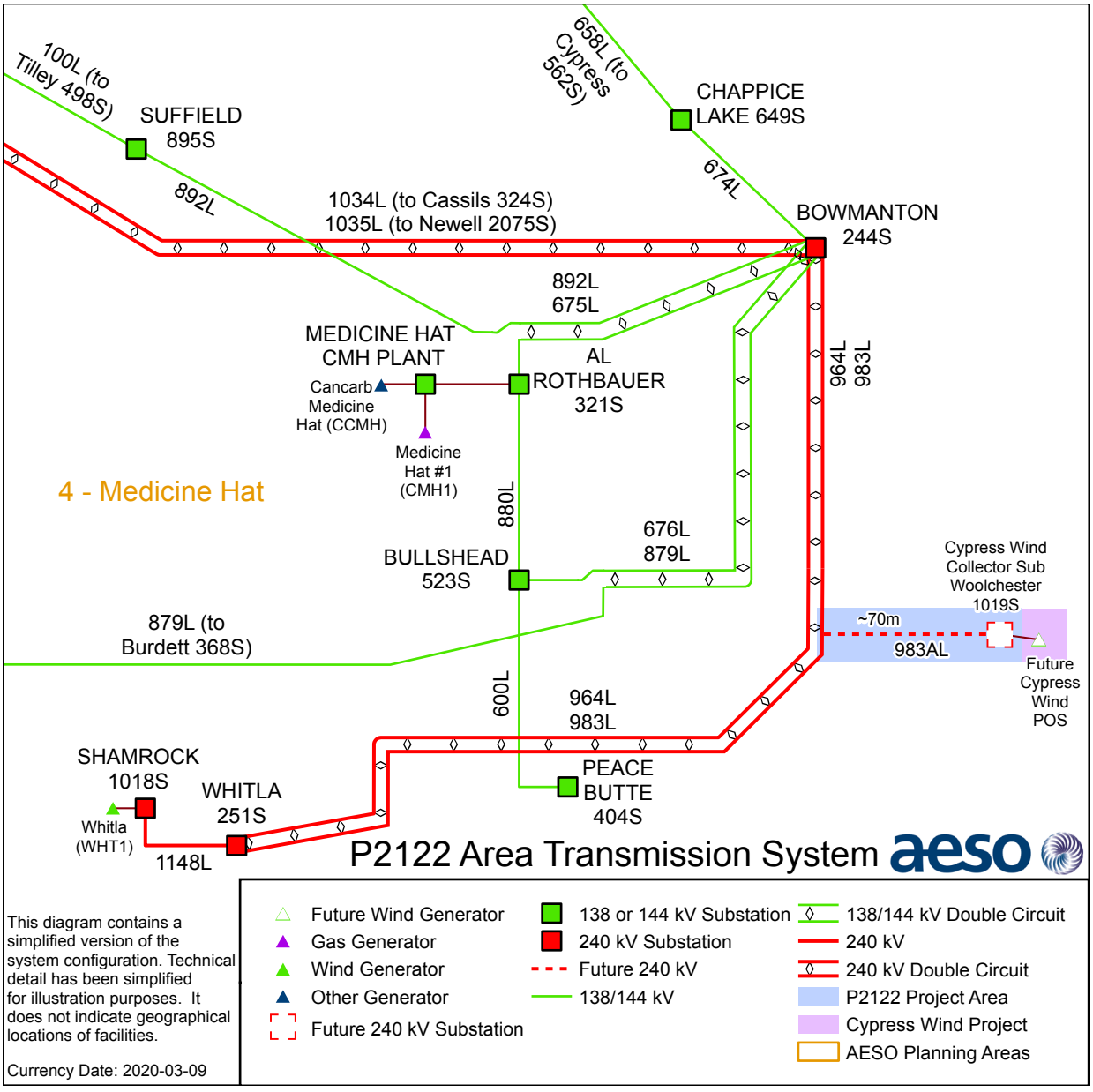
This alternative includes the following developments:

- Add one 240 kV circuit, approximately 70 metres in length,[1] to connect the Facility to the existing 240 kV transmission line 983L (between the Bowmanton 244S substation and the Whitla 251S substation) using a T-tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

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

[1] Exact line length is to be determined by the TFO

Figure 3-1: Connection Alternative 1



Alternative 2 – T-tap connection to the 240 kV transmission line 964L

This alternative includes the following developments:

- Add one 240kV circuit, approximately 90 metres in length,[2] to connect the Facility to the existing 240 kV transmission line 964L (between the Bownmanton 244S substation and the

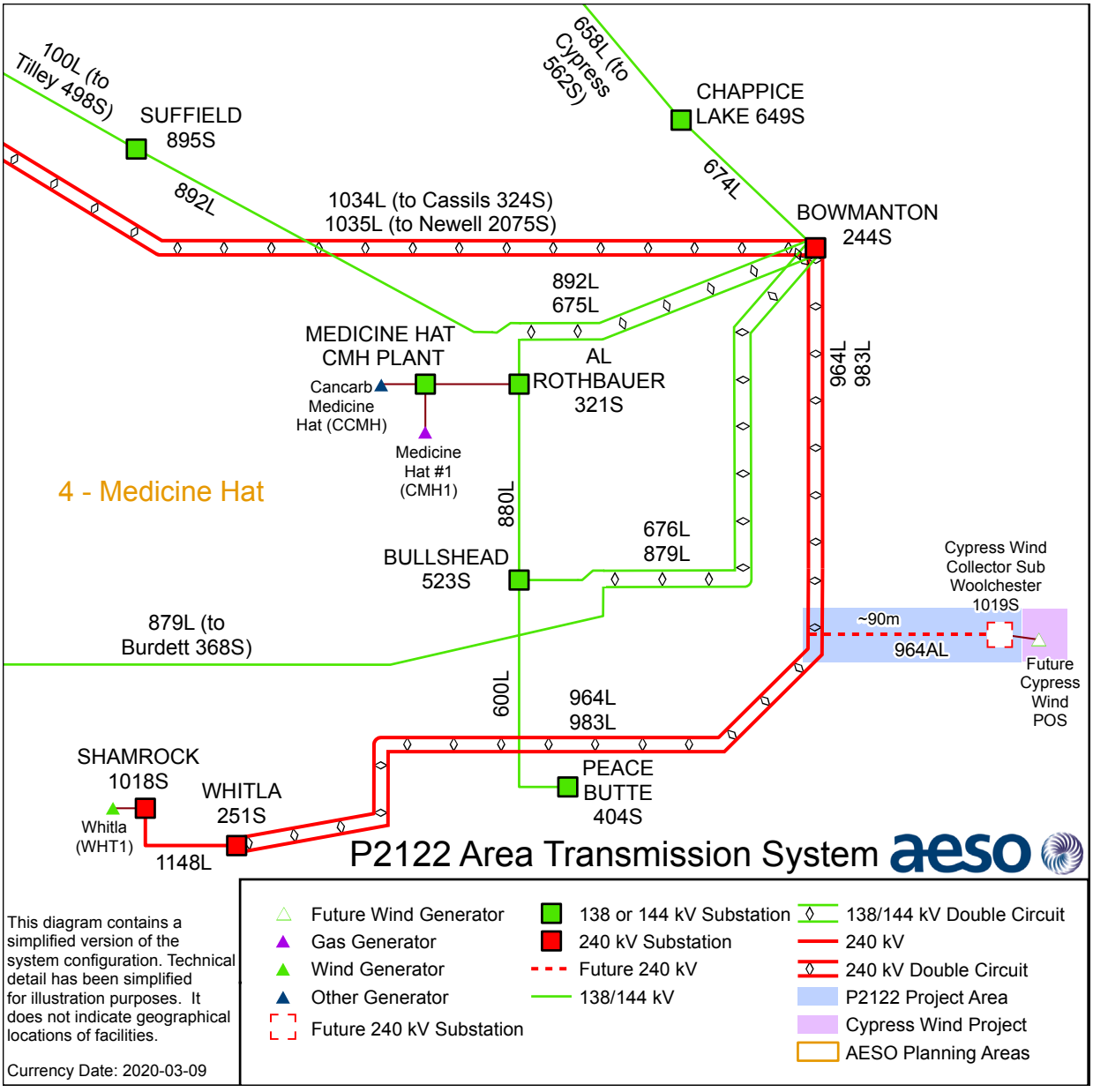
[2] Exact line length is to be determined by the TFO

Whitla 251S substation) using a T-tap configuration. This alternative also requires a crossing of the existing 240 kV transmission line 983L; and

- Add or modify associated equipment as required for the above transmission developments.

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

Figure 3-2: Connection Alternative 2



3.3 Connection Alternatives Selected for Further Study

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

3.4 Connection Alternatives Not Selected for Further Study

Alternative 2 includes similar scope of work as Alternative 1, but also requires crossing the 240 kV transmission line 983L. Thus, Alternative 2 would involve increased transmission development and hence, increased cost, compared to Alternative 1. Therefore, Alternative 2 was 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 was June 1, 2021. As a result, studies were performed using scenarios for 2021 Summer Peak (SP) and 2021 Summer Light (SL). The scheduled ISD has since been revised from June 1, 2021 to November 1, 2021. The shift in the scheduled ISD would not impact the results of this connection assessment, and would not change the conclusions and recommendations contained in this report.

Short-circuit studies were performed using the 2021 SP and the 2029 SP scenarios.

Table 4-1 lists the study scenarios. Post-Project scenarios reflect the requested Rate STS contract capacity of 201.6 MW at the Woolchester 1019S substation.

Table 4-1: Connection Study Scenarios

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
Pre-Project					
1	2021 Summer Peak (SP)	High Wind, High Import	2021 SP Pre-Project	0	0
2	2021 Summer Light (SL)	High Wind, Zero Import	2021 SL Pre-Project	0	0
Post-Project					
3	2021 SP	High Wind, High Import	2021 SP Post-Project	2.7	201.6
4	2021 SL	High Wind, Zero Import	2021 SL Post-Project	2.7	201.6
5	2029 SP	All generators in service	2029 SP Post-Project	2.7	201.6

The AESO Planning Region load forecasts used for the connection studies were based on the *AESO 2019 Long Term Outlook* (2019 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.[3]

Power flow studies were performed for 2021 SP and 2021 SL pre-Project scenarios, and for 2021 SP and 2021 SL post-Project scenarios.

4.2.2 Transient Stability Studies

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

Transient stability studies were performed for 2021 SP and 2021 SL post-Project scenarios.

4.2.3 Short-Circuit Current Level Studies

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

Short circuit studies were performed for the 2021 SP pre-Project scenario and for 2021 SP and 2029 SP post-Project scenarios.

4.3 Mitigation Measure Development and Evaluation

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

4.3.1 Post-Mitigation Studies

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

4.3.2 Constraint Effective Factor Studies

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

[3] 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.

5 Interpretation of Results

5.1 Results Overview

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

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

Detailed study results are provided in Attachment A.

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

Scenario	Type of Reliability Criteria Violation		Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Project Impact	Pre-Project Mitigation Measures	Post-Project Mitigation Measures
	Pre-Project	Post-Project					
2021 SP	Thermal - above emergency rating	Thermal - above emergency rating	1088L (Cassils 324S to Newell 2075S)	1087L (Cassils 324S to Newell 2075S)	Materially decreased	Existing RAS 149	Existing RAS 149

Notes:

- Materially decreased refers to a percent loading difference (post-Project percent loading minus pre-Project percent loading) below or equal to -3%.
- RAS 149 is an existing RAS (see Section 1.2.2 of Attachment A1).

5.2 Pre-Project Study Results

5.2.1 Category A Conditions

No Reliability Criteria violations were observed under the 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

The pre-Project power flow studies identified a thermal criteria violation on the 240 kV transmission line 1087L (Cassils 324S to Newell 2075S) following the loss of the 240 kV transmission line 1088L (Cassils 324S to Newell 2075S).

No voltage criteria violations were observed under Category B conditions.

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

5.3 Post-Project Study Results

5.3.1 Category A Conditions

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

The post-Project power flow studies identified a thermal criteria violation on the 240 kV transmission line 1087L (Cassils 324S to Newell 2075S) following the loss of the 240 kV transmission line 1088L (Cassils 324S to Newell 2075S).

No voltage criteria violations were observed under Category B conditions.

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

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

5.4 Mitigation Measures

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

5.4.1 Pre-Project

Prior to connection of the Project, all of the observed thermal criteria violations can be mitigated by the existing RAS 149.

5.4.2 Post-Project

After connection of the Project, all of the observed thermal criteria violations can be mitigated by the existing RAS 149.

5.4.3 Post-Project Mitigation Study Results

Under Category B conditions, all of the observed Reliability Criteria violations requiring RAS were mitigated.

6 Project Dependencies

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

7 Conclusions and Recommendations

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

This issue can be mitigated through the use of existing RAS 149. With implementation of this mitigation measure, connecting the project with the preferred alternative does not adversely affect the performance of the AIES.

Alternative 1 involves adding one 240 kV transmission circuit to connect the Facility to the existing 240 kV transmission line 983L using a T-tap configuration. The conductor to be used for the 240 kV circuit should have a minimum capacity of 225 MVA to meet the Market Participant's requested STS contract capacity.

Attachment A:
Engineering Connection Assessment Results

Engineering Connection Assessment: Study Results

P2122 Cypress Wind Power Project Connection

Cypress Renewable Energy Centre LP.

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

Role	Name	Date	Signature
Prepared	Carl Wang, P. Eng.	2020-03-09	
Reviewed & Approved	Ryan Cui, P. Eng.	2020-03-09	

PROFESSIONAL ENGINEER YUNFEI WANG ALBERTA
2020-03-09

Contents

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1 Introduction

This report presents the results of the engineering studies that were completed by AltaLink Management Ltd. (the Studies Consultant) to assess the impact of the Project (as defined in Attachment A1: AESO Engineering Connection Assessment Scope) on the performance of the Alberta interconnected electric system (AIES). The studies were performed in accordance with Attachment A1: AESO Engineering Connection Assessment: Study Scope, 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: 2021 Summer Peak High Generation Pre-Project

Category A Conditions

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

Category B Conditions

Thermal Criteria Violations

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

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

Contingency (System Element Lost)	Violation Location Details	Thermal Ratings (MVA)		Pre-Project Results	
		Normal Rating	Emergency Rating	Power Flow[a] (MVA)	% Loading[b]
1088L	1087L (Cassils 324S to Newell 2075S)	547	656	741.2	135.5

Notes:

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

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

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

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

2.1.2 Scenario 2: 2021 Summer Light High Generation 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

No Reliability Criteria violations were observed under Category B conditions.

3 Post-Project Study Results

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

As described in Section 2 of Attachment A1, the post-Project studies were performed using Alternative 1.

3.1 Power Flow Studies

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

3.1.1 Scenario 3: 2021 Summer Peak High Generation Post-Project

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

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

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

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-Project Results		Post-Project Results		% Loading Difference (Post-Pre)
				Observed Power Flow (MVA)	% Loading	Observed Power Flow (MVA)	% Loading	
1088L (Cassils 324S to Newell 2075S)	1087L (Cassils 324S to Newell 2075S)	547	656	741.2	135.5	719.3	131.5	-4.0

Voltage Criteria Violations

No voltage criteria violations were observed under Category B conditions.

POD Bus Voltage Deviations

No POD bus voltage deviations were observed.

3.1.2 Scenario 4: 2021 Summer Light High Generation Post-Project

Category A Conditions

No Reliability Criteria violations were observed under Category A conditions.

Category B Conditions

No Reliability Criteria violations were observed under Category B conditions.

3.2 Transient Stability Studies

Transient stability studies were completed for the post-project scenarios: Scenario 3 2021 Summer Peak and Scenario 4 2021 Summer Light.

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

Table 3-2: Transient Stability Study Results under Category B Conditions for Scenarios 3 and 4

Studied Contingency	Fault Description and Location	Results
1074L (Elkwater 264S – Bowmanton 244S)	3-phase fault at Elkwater 264S	Stable
	3-phase fault at Bowmanton 244S	Stable
983L (Elkwater 264S – Whitla 251S)	3-phase fault at Elkwater 264S	Stable
	3-phase fault at Whitla 251S	Stable
964L (Whitla 251S – Bowmanton 244S)	3-phase fault at Whitla 251S	Stable
	3-phase fault at Bowmanton 244S	Stable
1034L (Cassils 324S – Bowmanton 244S)	3-phase fault at Cassils 324S	Stable
	3-phase fault at Bowmanton 244S	Stable
1035L (Newell 2075S – Bowmanton 244S)	3-phase fault at Newell 2075S	Stable
	3-phase fault at Bowmanton 244S	Stable
892L (Suffield 895S – Bowmanton 244S)	3-phase fault at Suffield 895S	Stable
	3-phase fault at Bowmanton 244S	Stable
676L (Bullshead 523S – Bowmanton 244S)	3-phase fault at Bullshead 523S	Stable
	3-phase fault at Bowmanton 244S	Stable
600L (Peace Butte 404S – Bullshead 523S)	3-phase fault at Peace Butte 404S	Stable
	3-phase fault at Bullshead 523S	Stable
880L (Al Rothbauer 321S – Bullshead 523S)	3-phase fault at Al Rothbauer 321S	Stable
	3-phase fault at Bullshead 523S	Stable
675L (Al Rothbauer 321S – Bowmanton 244S)	3-phase fault at Al Rothbauer 321S	Stable
	3-phase fault at Bowmanton 244S	Stable
879L (Burdett 368S – Bowmanton 244S)	3-phase fault at Burdett 368S	Stable
	3-phase fault at Bowmanton 244S	Stable
658L/674L (Cypress 562S – Bowmanton 244S)	3-phase fault at Cypress 562S	Stable
	3-phase fault at Bowmanton 244S	Stable

4 Short Circuit Studies

4.1 Pre-Project Results

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

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

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)
Bowmanton 244S	240	249.8	6.97	0.004675+ j0.040710	7.36	0.008785+ j0.039973
	138	142.3	9.32	0.005067+ j0.051274	9.15	0.009598+ j0.057798
Whitla 251S	240	251.7	4.61	0.005380+ j0.061508	4.87	0.010574+ j0.060063
Shamrock 1018S	240	252.0	4.13	0.005981+ j0.068686	4.43	0.009018+ j0.062503
Elkwater 264S	240	249.0	4.76	0.005857+ j0.059452	6.96	0.002452+ j0.017596

4.2 Post-Project Results

4.2.1 Scenario 3: 2021 Summer Peak High Generation Post-Project

Post-Project short-circuit current levels for Scenario 3 are provided in Table 4-2.

Table 4-2: Post-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)
Bowmanton 244S	240	247.7	6.96	0.004673+ j0.040694	7.35	0.008785+ j0.039972
	138	141.2	9.31	0.005068+ j0.051260	9.14	0.009598+ j0.057797
Whitla 251S	240	251.7	4.64	0.005377+ j0.061491	4.90	0.010573+ j0.060062
Shamrock 1018S	240	252.0	4.15	0.005978+ j0.068670	4.46	0.009018+ j0.062503
Elkwater 264S	240	248.0	4.78	0.005853+ j0.059426	6.99	0.002451+ j0.017595
Woolschester 1019S	240	248.4	4.88	0.005791+ j0.058251	6.74	0.004088+ j0.023695

[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.

4.2.2 Scenario 5: 2029 Summer Peak Post-Project

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

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

Substation Name and Number	Base Voltage (kV)	Pre-Fault Voltage (kV)	3-Φ Fault (kA)	Positive Sequence Thevenin Source Impedance (R1+jX1) (pu)	1-Φ Fault (kA)	Zero Sequence Thevenin Source Impedance (R0+jX0) (pu)
Bowmanton 244S	240	246.5	6.96	0.004686+ j0.040630	7.35	0.008740+ j0.039836
	138	142.1	9.28	0.005176+ j0.051873	9.11	0.009739+ j0.058485
Whitla 251S	240	253.1	4.65	0.005459+ j0.061902	4.91	0.010677+ j0.060452
Shamrock 1018S	240	254.4	4.17	0.006097+ j0.069283	4.47	0.009209+ j0.063138
Elkwater 264S	240	247.9	4.47	0.005588+ j0.055618	6.48	0.002380+ j0.016948
Woolschester 1019S	240	248.3	4.89	0.005828+ j0.058337	6.75	0.004087+ j0.023693

5 Mitigation Measure Development and Evaluation

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

5.1 Pre-Project

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

Table 5-1: Pre-Project Mitigation Measures

Mitigation Measure	Location of Observed Violation	Contingency
Existing RAS 149	1087L (Cassils 324S - Newell 2075S)	1088L (Cassils 324S - Newell 2075S)

5.2 Post-Project

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

Table 5-2: Post-Project Mitigation Measures

Mitigation Measure	Location of Observed Violation	Contingency
Existing RAS 149	1087L (Cassils 324S - Newell 2075S)	1088L (Cassils 324S - Newell 2075S)

5.3 Evaluation of Mitigation Measures

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

The post-mitigation measures studies were performed under Category B conditions for Scenarios 1 and 3 using Alternative 1 and the RASs described in the previous section.

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

5.3.1 Scenario 1: 2021 Summer Peak Pre-Project

Category B Conditions

Thermal criteria violations observed under certain Category B conditions in the pre-Project studies were mitigated by RASs as shown in Table 5-3.

Table 5-3: Post-RAS Power Flow Study Results for Scenario 1

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Pre-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
1088L	1087L	547	656	741.2	135.5	528.4	96.6

5.3.2 Scenario 3: 2021 Summer Peak Post-Project

Category B Conditions

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

Table 5-4: Post-RAS Power Flow Study Results for Scenario 3

Contingency (System Element Lost)	Details of Violation (Violation Observed On)	Seasonal Continuous Rating (MVA)	Short-term (Emergency) Rating (MVA)	Post-Project Results		Post-RAS Action Results	
				Power Flow (MVA)	% Loading	Power Flow (MVA)	% Loading
1088L	1087L	547	656	719.3	131.5	506.5	92.6

5.4 Constraint Effective Factor Studies

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

Attachment A1
Engineering Connection Assessment: Study Scope

Engineering Connection Assessment: Study Scope

Cypress Wind Project Connection

Cypress Renewable Energy LP.

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Company Name	Name and Credentials	Date	Signature
Altalink Management Ltd. (Studies Consultant)	Carl Wang, P. Eng.	2019-11-26	
AESO	Payam Zamani, PhD, EIT Jorge Villena, PhD, P. Eng.	2019-11-28 2019-11-28	
AltaLink (Transmission Facility Owner)	Andrew Smith, P. Eng.	2019-12-4	
Cypress Renewable Enrgy LP. (Market Participant)	Zakaria Chayed	25-11-2019	

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1 Introduction

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

1.1 Project Overview

Cypress Renewable Energy Centre LP. (Market Participant) has submitted a request for system access service to the Alberta Electric System Operator (AESO) to connect its approved Cypress Wind Power Project (Facility) to the AIES. The Facility includes an approved collector station, designated as the Woolchester 1019S substation. The Facility is planned to be located in the Dunmore area, in the AESO planning area of Medicine Hat (Area 4).

The Market Participant's request includes: a request for a new system access service in the area, with a Rate STS, *Supply Transmission Service*, contract capacity of 201.6 MW, and a Rate DTS, *Demand Transmission Service*, contract capacity of 2.7 MW, and a request for transmission development (collectively, the Project).

The scheduled in-service date (ISD) for the Project is November 1, 2021.

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	2.7 MW
	Type	Station Service
	Motors (number and size)	Not Applicable
	Power factor	Not Applicable
	Future load expansion plans	None
Generation	Generation type	Wind
	Existing Rate STS, *Supply Transmission Service,* contract capacity	No existing contract
	Requested Rate STS	201.6 MW
	Number and size of generating units	48 wind turbines at 4.2 MW each
	Maximum authorized real power (MARP)	201.6 MW
	Maximum capability (MC)	201.6 MW

Project Component		Description
	Reactive power capability	69.22 MVAr (0.95 pf absorbing)
		97.64 MVAr (0.9 pf producing)
	Future generation expansion plans	None

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

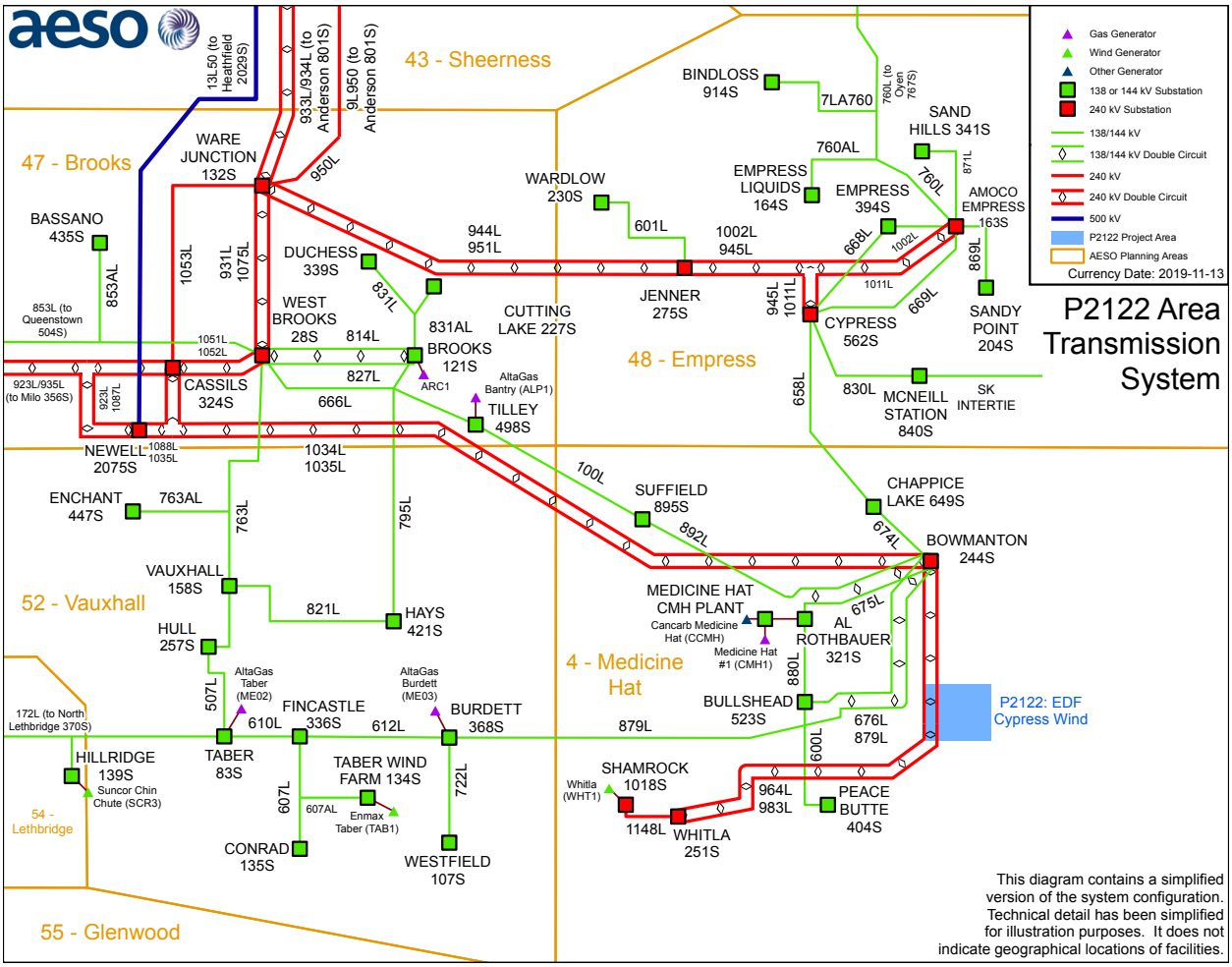
1.2.1 Study Area

Geographically, the Project is located in the AESO planning area of Medicine Hat (Area 4) which is part of the AESO South Planning Region.

The Study Area consists of the AESO planning areas of Vauxhall (Area 52), Medicine Hat (Area 4), Empress (Area 48), and Brooks (Area 47).

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

Figure 1-1: Transmission System in the Study Area



1.2.2 Existing Constraints

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

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

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

- RAS 27: 562S Cypress McNeil Power and Undervoltage Scheme
- RAS 28: 163S Amoco Empress Reverse Power and Undervoltage Scheme
- RAS 29: McNeil (840s) Under Voltage Runback Scheme
- RAS 33: Cypress (T562s) Reverse Power and Undervoltage Scheme
- RAS 141: 498S Voltage Instability Mitigation
- RAS 149: EATL HVDC

- RAS 150: WATL HVDC
- RAS 164: 1034L and 1035L Contingency Mitigation

2 Connection Alternative to be Studied

The following alternative will be studied:

Alternative 1 – T-tap connection to the existing 240 kV transmission line 983L

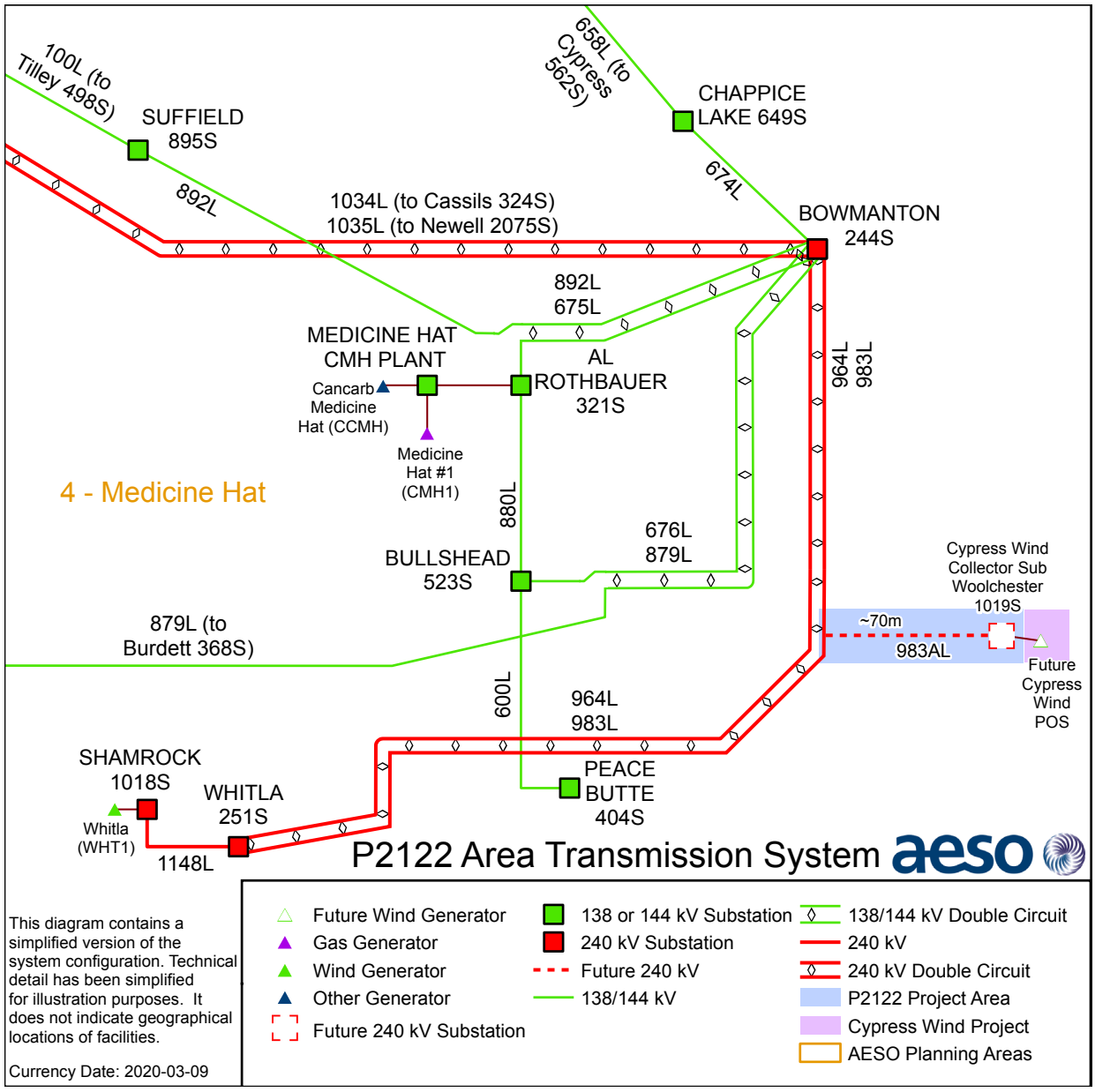
This alternative includes the following developments:

- Add one 240kV circuit, approximately 70 metres in length,[1] to connect the Facility to the 240kV transmission line 983L (between the Bownmanton 244S substation and the Whitla 251S substation) using a T-tap configuration; and
- Add or modify associated equipment as required for the above transmission developments.

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

[1] Exact line length is to be determined by the TFO

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 and Category B events. For the purpose of applying the TPL standards to the studies documented in this report, Applicable Ratings are defined as follows:

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

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

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

3.2 ISO Rules and Information Documents

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

The TCM Rule will be followed to set up the study scenarios and assess the impact of the Project. In addition, due regard will be given to the AESO's *Connection Study Requirements*, the AESO's *Generation and Load Interconnection Standard*, Section 502.5 of the ISO rules, *Generating Unit Technical Requirements*, and Section 502.6 of the ISO rules, *Generating Unit Operating Requirements*.

3.3 Aggregated Generating Facility Requirements

The Facility should meet the technical requirements presented in Section 502.1 of the ISO rules, *Aggregated Generating Facilities Technical Requirements*.

4 Scenarios and Assumptions

4.1 Scenarios

The studies will be performed using 2021 study scenarios. The Study Area has low load variation between winter and summer seasons, however the transmission facilities in the Study Area have summer ratings that are lower than their winter ratings. Therefore, only summer loading scenarios are selected for engineering studies as they provide the most stressed operating conditions.

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

Table 4-1: Connection Study Scenarios

Scenario No.	Year/Season	System Generation Dispatch Conditions	Scenario Name	Project Load (MW)	Project Generation (MW)
pre-Project					
1	2021 Summer Peak (SP)	High Wind, High Import	2021 SP Pre-Project	0	0
2	2021 Summer Light (SL)	High Wind, Zero Import	2021 SL Pre-Project	0	0
post-Project					
3	2021 SP	High Wind, High Import	2021 SP Post-Project	2.7	201.6
4	2021 SL	High Wind, Zero Import	2021 SL Post-Project	2.7	201.6
5	2029 SP	All generators in service	2029 SP Post-Project	2.7	201.6

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

4.2 Assumptions

4.2.1 System Project Assumptions

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

4.2.2 Connection Project Assumptions

The pre-Project and post-Project connection assessment will not include any connection projects other than those listed in

Table 4-5.

4.2.3 Load Assumptions

The load forecast to be used for the studies is shown in Table 4-2 and is a forecast for the AESO South Planning Region peak based on the AESO's *2019 Long-term Outlook* (2019 LTO)[2]. For the studies, when loads for the Alberta Internal Load (AIL) are modified to align with the load forecast in the 2019 LTO, the active power to reactive power ratio in the base case scenarios will be maintained.

Table 4-2: Forecast Area Peak Load (2019 LTO at AESO South Planning Region Peak)

AESO Planning Area or Region Name	Forecast Peak Load by Year/Season (MW)	
	2021 SP	2021 SL
South Planning Region[a]	1513	919

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

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

4.2.4 Generation Assumptions

The generation forecast to be used for the studies is based on the 2019 LTO. The generation assumptions for the studies will assume high wind dispatch conditions. Additional studies may be required in the event of changes to the AESO's corporate forecast.

The existing non-renewable and hydro generation dispatch conditions for the study scenarios are described in Table 4-3.

Table 4-3: Existing Non-Renewable and Hydro Generation Dispatch Conditions

Facility Name	Unit No.	Bus No.	Pmax (MW)	AESO Planning Area No.	Unit Net Generation[a] (MW) per Scenario	
					2021 SP	2021 SL
Irrican Hydro	1	450	7	55	6.4	6.0
Lethbridge Taber	2	3272	8	52	7.4	0
Lethbridge Burdett	3	4269	7	52	6.6	0
Altagas Bantry	1	4275	7	47	5.1	0

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

Per the 2019 LTO, the total forecast renewable electricity generation in 2021 is 2,686.7 MW. This includes existing, under construction and planned renewable electricity generation facilities.

[2] The 2019 LTO is available on the AESO website.

Using the 2019 LTO's 2021 renewable generation forecast of 2,686.7 MW, the generation assumptions will dispatch the renewable electricity generation facilities in order to yield the credible worst-case power flow conditions for the Study Area. Post-Project dispatch levels for the existing and under-construction renewable electricity generation facilities are shown in Table 4-4.

Table 4-5 lists the pre-Project dispatch levels for the planned wind and solar generation projects in the AESO South and Central planning regions that are included in the study scenarios.

Table 4-4: Dispatch Conditions for Existing Renewable Generation Facilities

Facility Name and Code	AESO Planning Area No.	Bus No.	MC (MW)	Unit Net Generation[s] (MW)
				2021 SP/2021 SL
Ardenville Wind (ARD1)	53	4735, 4740	68	68
Blue Trail Wind (BTR1)	53	66328, 67328	66	66
Castle River #1 (CR1)	53	2234, 3234	39	39
Castle Rock Wind Farm (CRR1)	53	67221	77	77
Cowley Ridge (CRWD)	53	255, 265, 4264	20	20
Enmax Taber (TAB1)	52	15343, 16343	81	81
Kettles Hill (KHW1)	53	2402, 3402	63	63
McBride Lake Windfarm (AKE1)	53	2901, 3901, 4901	73	73
Soderglen Wind (GWW1)	53	12358, 13358	71	71
Summerview 1 (IEW1)	53	2338, 3338	66	66
Summerview 2 (IEW2)	53	4339, 5337	66	66
Suncor Chin Chute (SCR3)	54	2389	30	30
Suncor Magrath (SCR2)	53	11002	30	30
Suncor Wintering Hills (SCR4)	43	60789, 60791, 60793, 60846, 60848, 60850	88	88
Old Man River(OWF1)	53	61543	46	46
Blackspring Ridge(BSR1)	49	61736, 61737	300	300
Brooks Solar (BSC1)	47	553257	15	15
Whitla (WHT1)	4	60990	201.6	201.6
Castle Rock Ridge 2 (CRR2)	53	567221	30.6	7.9
Riverview (RIV1)	53	69221	105	0
AESO South Planning Region Subtotal			**1,546.2**	**1,408.5**

Facility Name and Code	AESO Planning Area No.	Bus No.	MC (MW)	Unit Net Generation[a] (MW)
				2021 SP/2021 SL
Ghost Pine (NEP1)	42	2621 to 2625	82	82
Halkirk (HAL1)	42	66435, 67435	150	150
Fortis Bull Creek Phases 1 and 2(Bul1 & BUL2)	37	4222	29.5	29.5
AESO Central Planning Region Subtotal			**261.5**	**261.5**
Total			**1,807.7**	**1,670.0**

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

Table 4-5: Dispatch Conditions for Planned Renewable Generation Projects[3]

AESO Project No. and Name	Project Type	Planned ISD	Planning Area No.	AESO Stage	Pmax (MW)	Unit Net Generation[s] (MW)
						2021 SL/ 2021 SP Pre-Project
AESO South Planning Region						
P1892 Fortis Buffalo Atlee Cluster 3 WAGF (REP #2)	BTF	18-Mar-19	47	5	17.3	17.3
P1853 Fortis Buffalo Atlee Cluster 1 WAGF (REP #2)	BTF	01-Mar-19	47	5	18.3	18.3
P2199 Buffalo Atlee Wind Farm 2 (REP #2)	BTF	30-Jun-21	47	2	13.8	13.8
P1719 Stirling WAGF Project (REP #2)	Connection	20-Dec-19	54	4	113	28
P2122 EDF Cypress Wind (REP #2)	Connection	01-Jun-21	4	2	201.6	0
P1533 Joss MPC WAGF (REP #3)	Connection	28-Jun-19	47	5	122	122
P1698 Joss Jenner WAGF - Phase 2 (REP #3)	BTF	01-May-19	47	5	71.4	71.4
P2041 TransAlta Windrise MPC Wind (REP #3)	Connection	02-Nov-20	53	2	207	207
P1838 Fortis 895S Suffield DG PV	BTF	01-Feb-2020	4	5	22	22
P1878 Fortis 257S Hull DER Solar	BTF	15-Oct-2019	52	5	24.5	24.5

[3] As of October 2019, https://www.aeso.ca/grid/projects/project-reports

P1922 FortisAlberta Vauxhall Solar DER	BTF	01-Nov-2019	52	5	22	22
P1812 Suncor Forty Mile Granlea WAGF	Connection	01-Jun-2020	4	5	200	200
AESO South Planning Region Subtotal					**1,032.9**	**746.3**
AESO Central Planning Region						
P1567 EDPR Sharp Hills Wind Farm (REP #1)	Connection	01-May-19	42	4	248.4	248.4
P2097 FortisAlberta Innisfail 214S DER Solar	BTF	Dec 15, 2019	39	5	22	22
Total Planned					**1,303.3**	**1,016.7**
Total Planned, Existing and Under Construction					**3,111**	**2686.7**

Note: 85
[a] "Unit Net Generation" refers to gross generating unit output (MW) less unit service load.

The pre-project scenarios will represent the situations where the Project is not in service. Thus, the Project will be switched off in pre-project scenarios.

The post-Project scenario renewable generation dispatch levels were identical to the pre-Project scenario dispatch levels shown in Table 4-4 and Table 4-5, with the following adjustments:

- Dispatch the Project (P2122 Cypress Wind Power Project Connection) to 201.6 MW
- Dispatch the planned P2041 Windrise Wind Power Project Connection to 5.4 MW

This will result in a total renewable dispatch consistent with the 2019 LTO's renewable generation forecast of 2,686.7 MW for 2021.

4.2.5 Intertie Flow Assumptions

The intertie flow assumptions for the Alberta-British Columbia (AB-BC), Alberta-Saskatchewan (AB-SK), and Alberta-Montana (MATL) interties are shown in
Table 4-6.

For the 2029 SP post-Project scenario, the intertie flows should be as per the published AESO base cases.

Table 4-6: Intertie Flows by Scenario

Scenario Name	Import (-) / Export (+) by Intertie		
	AB-BC	AB-SK	MATL
2021 SP	-794	-150	0
2021 SL	0	0	0

4.2.6 HVDC Power Order Assumptions

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

For the 2029 SP Post-Project scenario, the HVDC flows should be as per the published AESO base cases.

Table 4-7: HVDC Power Order by Scenario

Scenario Name	WATL (MW)	EATL (MW)
2021 SP	250 S → N	800 S → N
2021 SL	575 S → N	1000 S → N

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

The reactive power limits of the MVAr exchanges between the HVDC terminals (WATL and EATL) and the connected alternating current (AC) transmission systems are shown in Table 4-8. These limits must be maintained when performing the studies.

Table 4-8: HVDC to Adjacent AC System MVAr Exchange Limits

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

4.2.7 Transmission Facility Ratings

The legal owner of transmission facilities (TFO) provided the thermal ratings assumptions for the existing transmission lines in the Study Area. Table 4-9 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 4-9: Thermal Rating Assumptions for Key Transmission Lines in the Study Area

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)	Emergency Rating (MVA)
			Summer	Summer
964L	Bowmanton 244S - Whitla 251S	240	952	1047
983L	Whitla 251S - Elkwater 264S	240	952	1047
1074L	Bowmanton 244S - Elkwater 264S	240	952	1047

Line ID	Line Description	Voltage Class (kV)	Normal Rating (MVA)	Emergency Rating (MVA)
			Summer	Summer
1034L	Bowmanton 244S - Cassils 324S	240	931	1024
1035L	Bowmanton 244S - Newell 2075S	240	952	1047
1087L	Cassils 324S - Newell 2075S	240	547	656
676L	Bowmanton 244S - Bullshead 523S	138	369	406
675L	Al Rothbauer 321S - Bowmanton 244S	138	96	133
880L	Bullshead 523S - Al Rothbauer 321S	138	123	135
892L	Bowmanton 244S - Suffield 895S	138	67	74
666L	West Brooks 28S - Tilley 498S	138	120	133
100L	Tilley 498S - Suffield 895S	138	69	76
612L	Fincastle 336S - Burdett 368S	138	85	94
610L	Taber 83S - Fincastle 336S	138	85	94
879L	Bowmanton 244S - Burdett 368S	138	85	94
658L	Chappice Lake 649S - Cypress 562S	138	81	89
668L	Cypress 562S - Empress 394S	138	121	133
669L	Cypress 562S - Amoco Empress 163S	138	177	195
674L	Bowmanton 244S - Chappice Lake 649S	138	121	133
1087L	Cassils 324S - Newell 2075S	240	547	656
1088L	Cassils 324S - Newell 2075S	240	931	1117

The TFO provided the details of the substation transformers in the Study Area. The key transformers in the Study Area are shown in Table 4-10.

Table 4-10: Summary of Key Transformers in the Study Area

Substation Name and Number	Transformer ID	Transformer Voltages (kV)	Transformer Rating (MVA)
North Lethbridge 370S	T3	240/138 kV	193.6
	T5	240/138 kV	200
	T6	240/138 kV	200
Westbrooks 28S	T1	240/138 kV	400
	T2	240/138 kV	400
Bowmanton 244S	T1	240/138 kV	200
	T2	240/138 kV	200

The TFO provided the details of the shunt elements in the Study Area. The key shunt elements in the Study Area are shown in Table 4-11.

Table 4-11: Summary of Key Shunt Elements in the Study Area

Substation Name and Number	Voltage Class (kV)	Capacitors		Reactors	
		Number of Switched Shunt Blocks	Total at Nominal Voltage (MVAr)	Number of Switched Shunt Blocks	Total at Nominal Voltage (MVAr)
Taber 83S	138	1	24.46	-	-
		1	24.5		
Hays 421S	138	1	22.96	-	-
Picture Butte 120S	240	2	50	-	-
Burdett 368S	138	1	24.46	-	-
		1	24.5		
Tilley 498S	138	1	27.17	-	-
West Brooks 28S	240	-	-	1	50
Whitla 251S	240	-	-	2	75
McNeil 840S	138	2	24.8	-	-
Bullshead 523S	138	1	18.3	-	-

4.2.8 Protection Fault Clearing Times

The transient stability studies will be performed using the actual fault clearing times for the selected contingencies, as provided by the TFO and as shown in Table 4-12. Only those contingencies shown in Table 4-12 will be studied for transient stability studies.

Table 4-12: Protection Fault Clearing Times

Contingency (System Element Lost)	Fault Location	Clearing Times (Cycles)	
		Near End	Far End
1074L (Elkwater 264S – Bowmanton 244S)	Elkwater 264S	5	6
1074L (Elkwater 264S – Bowmanton 244S)	Bowmanton 244S	5	6
983L (Elkwater 264S – Whitla 251S)	Elkwater 264S	5	6
983L (Elkwater 264S – Whitla 251S)	Whitla 251S	5	6

964L (Whitla 251S – Bowmanton 244S)	Whitla 251S	4	5
964L (Whitla 251S – Bowmanton 244S)	Bowmanton 244S	4	5
1034L (Cassils 324S – Bowmanton 244S)	Cassils 324S	4	5
1034L (Cassils 324S – Bowmanton 244S)	Bowmanton 244S	4	5
1035L (Newell 2075S – Bowmanton 244S)	Newell 2075S	4	5
1035L (Newell 2075S – Bowmanton 244S)	Bowmanton 244S	4	5
892L (Suffield 895S – Bowmanton 244S)	Suffield 895S	6	27
892L (Suffield 895S – Bowmanton 244S)	Bowmanton 244S	6	27
676L (Bullshead 523S – Bowmanton 244S)	Bullshead 523S	6	27
676L (Bullshead 523S – Bowmanton 244S)	Bowmanton 244S	6	27
600L (Peace Butte 404S – Bullshead 523S)	Peace Butte 404S	9	30
600L (Peace Butte 404S – Bullshead 523S)	Bullshead 523S	9	30
880L (Al Rothbauer 321S – Bullshead 523S)	Al Rothbauer 321S	9	30
880L (Al Rothbauer 321S – Bullshead 523S)	Bullshead 523S	9	30
675L (Al Rothbauer 321S – Bowmanton 244S)	Al Rothbauer 321S	6	8
675L (Al Rothbauer 321S – Bowmanton 244S)	Bowmanton 244S	6	8
879L (Burdett 368S – Bowmanton 244S)	Burdett 368S	6	27
879L (Burdett 368S – Bowmanton 244S)	Bowmanton 244S	6	27
658L/674L (Cypress 562S – Bowmanton 244S)	Cypress 562S	6	27
658L/674L (Cypress 562S – Bowmanton 244S)	Bowmanton 244S	6	27

4.2.9 Project Dynamic Data

Dynamic data for the Project can be found in Attachment A7.

4.2.10 Voltage Profile Assumption

ID #2010-007RS will be used to establish system normal (i.e., pre-contingency) voltage profiles for key area busses prior to commencing any studies. Table 2-1 of the *Transmission Planning Criteria – Basis and Assumptions* applies for the busses not included in ID #2010-007RS. These voltages will be used to set the voltage profile for the study base cases prior to the power flow studies.

5 Study Methodology

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

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

Scenario No. and Name		Power Flow		Transient Stability		Short Circuit
		Category		Category		Category A
		A	B	A	B	
pre-Project						
1	2021 SP	X	X			X
2	2021 SL	X	X			
post-Project						
3	2021 SP	X	X		X	X
4	2021 SL	X	X		X	
5	2029 SP					X

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

5.1 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 to be studied are shown in Table 5-1.

5.1.1 Contingencies to be Studied

Power flow studies will be performed for the Category A and all Category B conditions in the Study Area. The transmission elements in the study area and the ties to the adjacent areas are to be monitored.

5.2 Transient Stability Studies

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

The report presenting the results of the transient stability studies must provide response plots for several variables, including rotor angle, and active and reactive power output for the proposed generation facility and generators listed below:

- City of Medicine Hat system
- Shepard Power Plant
- Capital Power Whitla Wind Power Facility
- EDF Cypress Wind Power Facility

The results report must also provide the response plots for following key 240 kV and 138 kV buses:

- Bowmanton 244S substation 240 kV bus
- Bowmanton 244S substation 138kV bus
- Whitla 251S substation 240kV bus
- Shamrock 1018S substation 240kV bus
- Planned Woolchester 1019S substation 240 kV bus (including in post-Project studies only)

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.

5.2.1 Contingencies to be Studied

Transient stability studies will be performed for the contingencies shown in Table 4-12.

5.3 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.

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

- Bowmanton 244S substation 240 kV and 138 kV busses
- Whitla 251S substation 240 kV bus
- Shamrock 1018S substation 240k bus
- Planned Woolchester 1019S substation 240 kV bus (including in post-Project studies only)

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

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

6 Mitigation Measures

6.1 Development

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

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

- Develop tables showing the constraint effective factors[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.

7 Changes to Study Assumptions

This study will utilize the AESO's planning base cases, which include the AESO's current corporate forecast (2019 LTO). Sensitivity studies or restudy may be required in the event of revisions to the AESO's corporate forecast or other study assumptions. Additional engineering studies may also be required to assess new connection alternatives, changes to project ISD, or delays in proposed system developments. Any additional or revised study requirements shall be captured in a signed Study Scope Amendment document.

Attachment A: Transmission Planning Criteria – Basis and Assumptions

Transmission Planning Criteria – Basis and Assumptions

Date: July 9, 2019

Version: V1.2

Alberta Electric System Operator

Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4

Phone: 403-539-2450 | Fax: 403-539-2949

www.aeso.ca

@theaeso

1. Introduction

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

2. Transmission Reliability Standards and Criteria[1]

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

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

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

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

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

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

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

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

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

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

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

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

2.1 Thermal Loading Criteria

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

2.2 Voltage Range and Voltage Stability Criteria

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

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

Nominal Voltage	Extreme Minimum	Normal Minimum	Normal Maximum	Extreme Maximum
500	475	500	525	550
240	216	234	252	264
260 (Northeast & Northwest)*	234	247	266	275
144	130	137	151	155
138	124	135	145	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

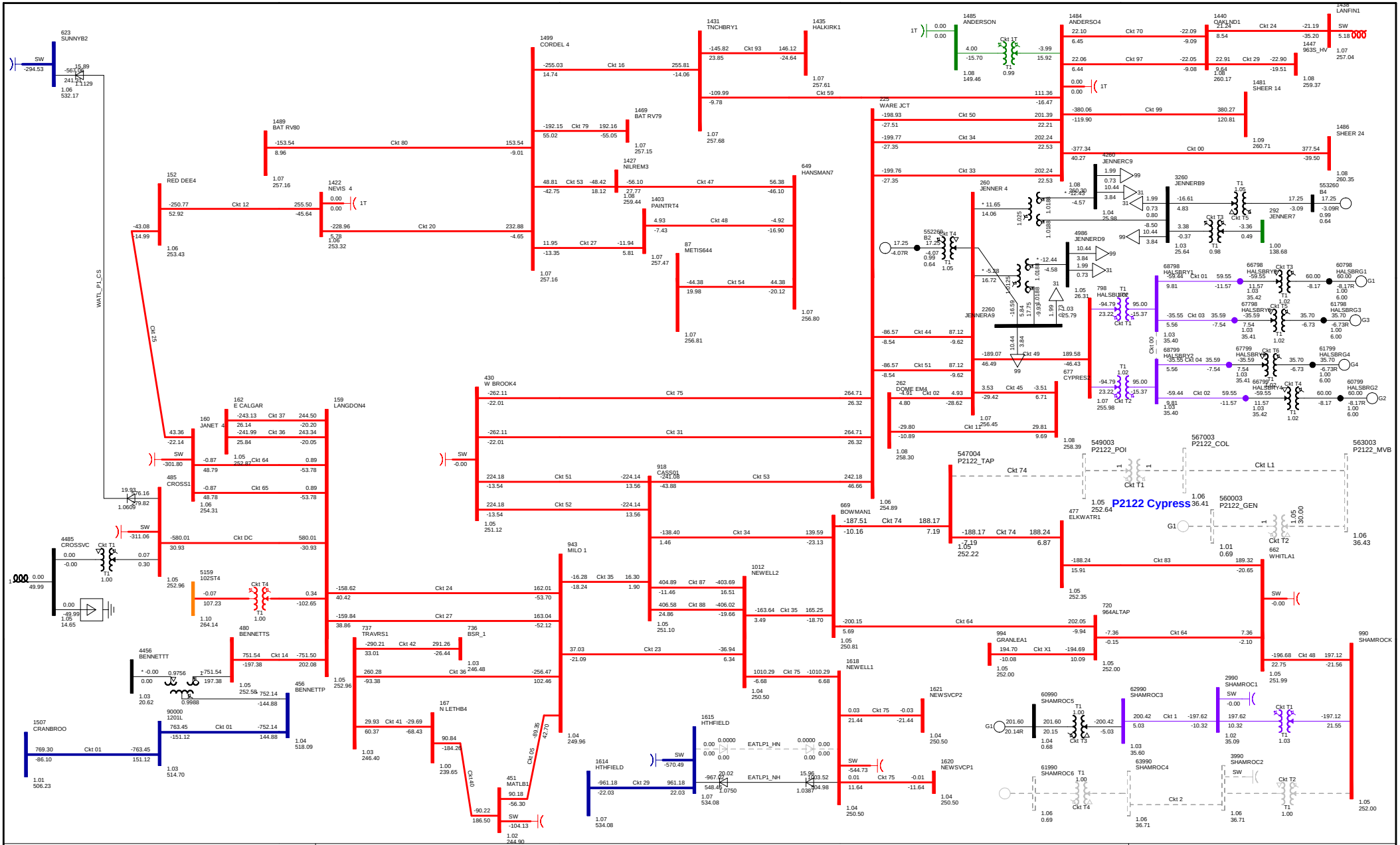
Table 2-4: Stuck Breaker Clearing Times for Lines

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



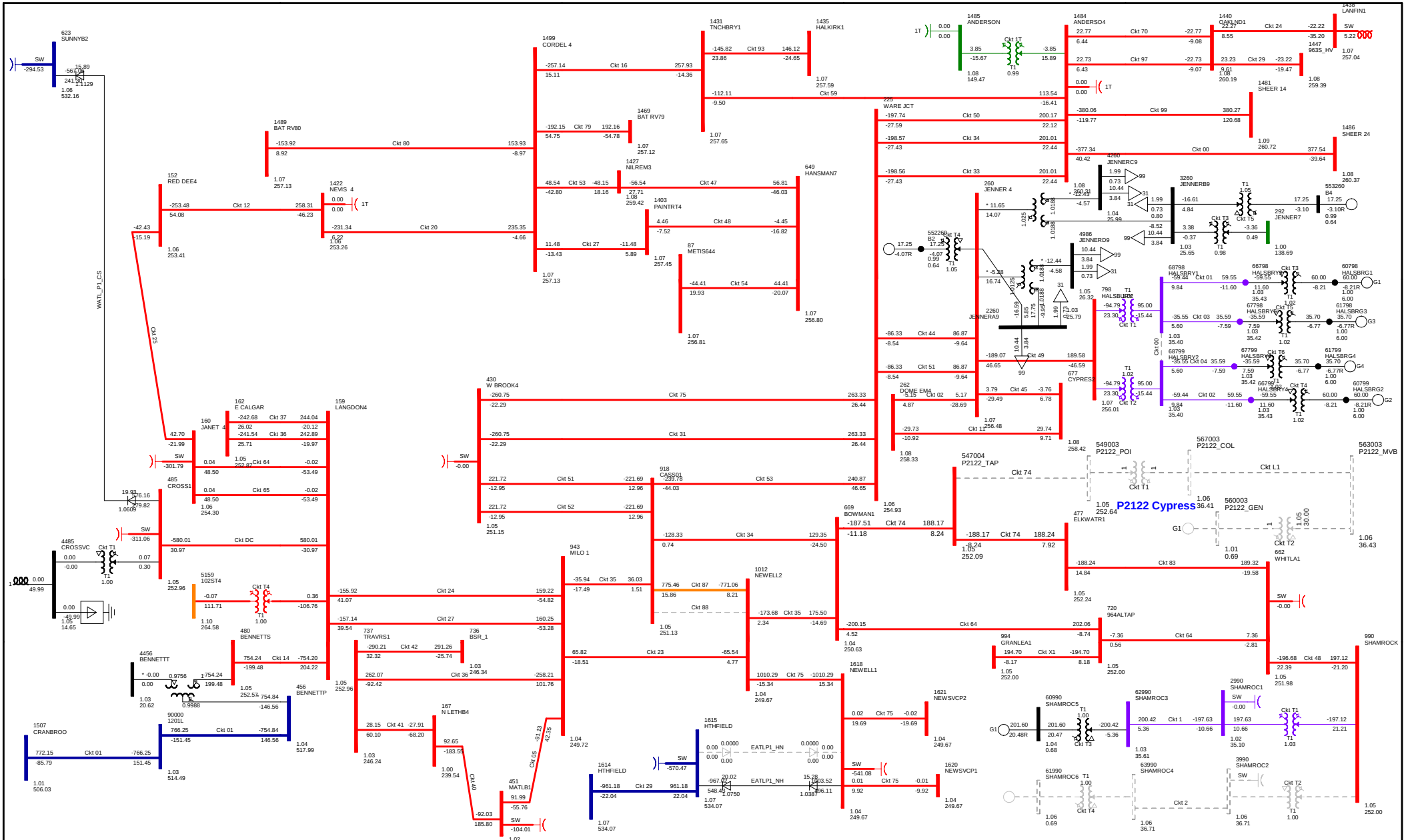
P2122 Cypress Wind Farm (REP)

BC Import:793.73 MW Sask Import:150.00 MW MATL Import:-0.00 MW

MH Export: -62.17 MW

FIGURE A2.1-1-N-0: NORMAL OPERATION
2021 SUMMER PEAK (PRE-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 kV 0.900 kV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



P2122 Cypress Wind Farm (REP)

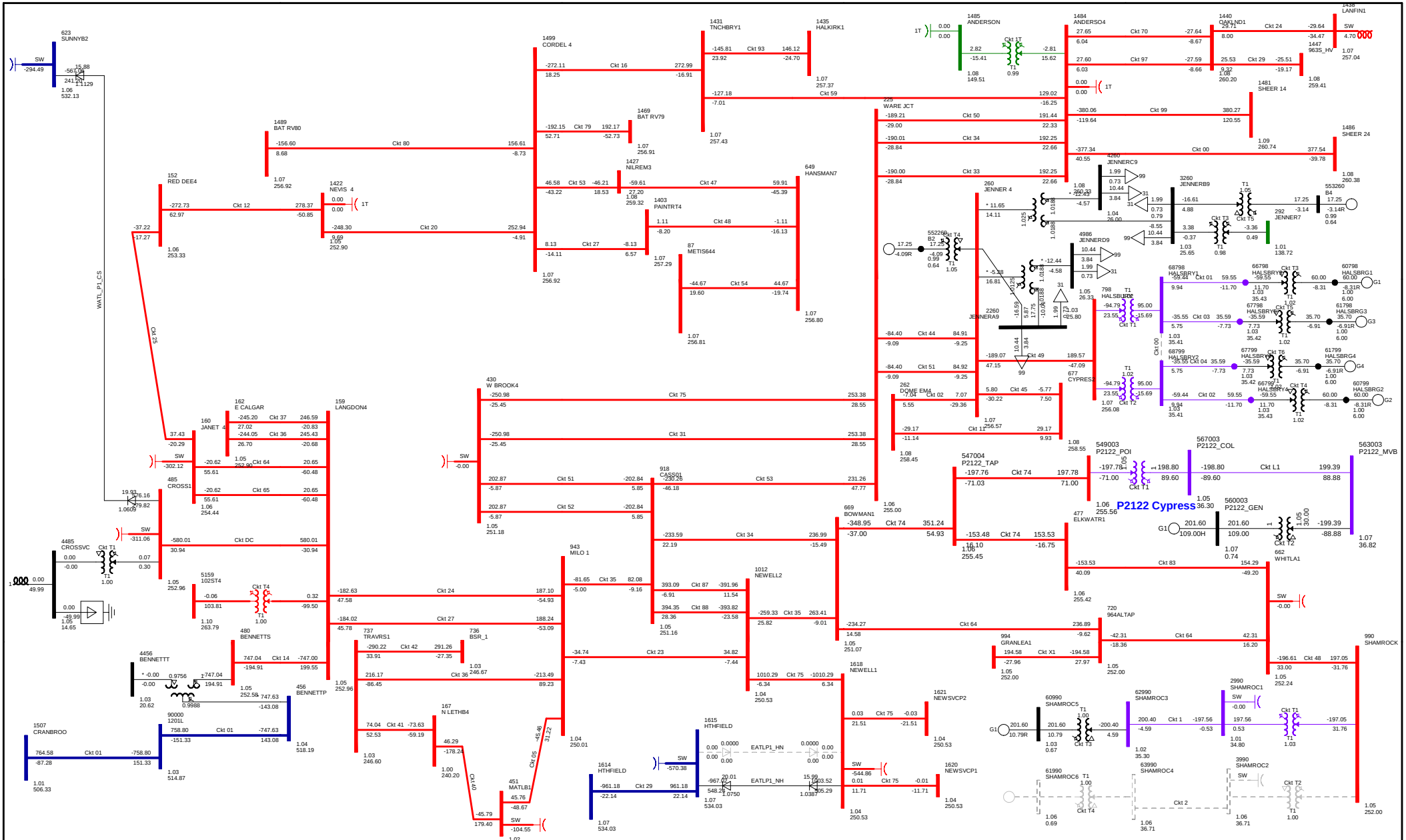
BC Import:796.86 MW Sask Import:150.00 MW MATL Import:-0.00 MW

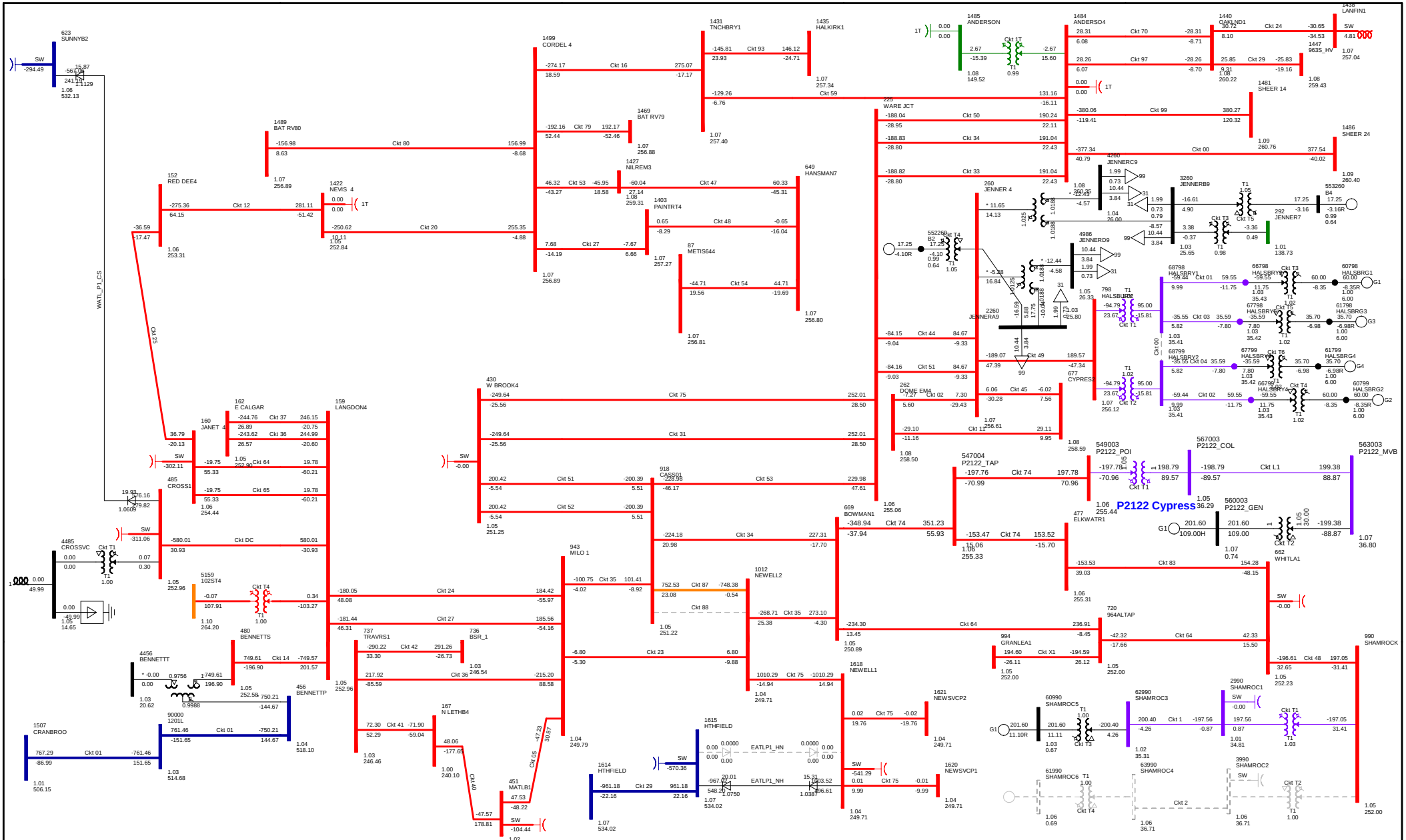
MH Export: -62.17 MW

FIGURE A2.1-2 N-1: 1088L (CASSILS 324S TO NEWELL A2075S)
2021 SUMMER PEAK (PRE-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 kV 0.900 kV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A3
Post-Project Power Flow Diagrams


P2122 Cypress
WATL_P1_CS
623 SUNNYB2
152 RED DEE4
1489 BAT RV80
1422 NEVIS 4
1499 CORDEL 4
1431 TNCHBRY1
1435 HALKIRK1
1469 BAT RV79
1427 NILREM3
1403 PAINTRT4
87 METIS644
649 HANSMAN7
1485 ANDERSON
1484 ANDERSO4
1440 OAKLND1
1438 LANFIN1
1447 963S_HV
1481 SHEER 14
1486 SHEER 24
225 WARE JCT
260 JENNER 4
4260 JENNERC9
3260 JENNERB9
553260 B4
292 JENNER7
4986 JENNERD9
552260 B2
2260 JENNERA9
68798 HALSBRY1
66798 HALSBRY3
60798 HALSBRG1
67798 HALSBRY5
61798 HALSBRG3
68799 HALSBRY2
66799 HALSBRY4
67799 HALSBRY6
61799 HALSBRG4
60799 HALSBRG2
798 HALSBUS6
677 CYPRESS
262 DOME EM4
547004 P2122_TAP
549003 P2122_POI
567003 P2122_COL
563003 P2122_MVB
560003 P2122_GEN
477 ELKWATR1
662 WHITLA1
720 964ALTAP
994 GRANLEA1
990 SHAMROCK
2990 SHAMROC1
62990 SHAMROC3
60990 SHAMROC5
3990 SHAMROC2
63990 SHAMROC4
61990 SHAMROC6
160 JANET 4
162 E CALGAR
159 LANGDON4
485 CROSS51
4485 CROSSVC
5159 102ST4
480 BENNETTS
4456 BENNETTT
456 BENNETTP
1507 CRANBROO
90000 1201L
430 W BROOK4
918 CASS01
943 MILO 1
737 TRAVRS1
736 BSR_1
167 N LETHB4
451 MATLB1
1012 NEWELL2
1618 NEWELL1
1621 NEWSVCP2
1620 NEWSVCP1
669 BOWMAN1
1615 HTHFIELD
1614 HTHFIELD
EATLP1_HN
EATLP1_NH
P2122 Cypress Wind Farm (REP)
BC Import:793.18 MW Sask Import:150.00 MW MATL Import:0.00 MW
MH Export: -62.17 MW
FIGURE A3.1-1-N-0: NORMAL OPERATION
2021 SUMMER PEAK (POST-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020



P2122 Cypress Wind Farm (REP)

BC Import:796.16 MW Sask Import:150.00 MW MATL Import:0.00 MW

MH Export: -62.17 MW

FIGURE A3.1-2 N-1: 1088L (CASSILS 324S TO NEWELL A2075S)
2021 SUMMER PEAK (POST-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 kV 0.900 kV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A4
Post-Project Transient Stability Diagrams

SCENARIO: P2122 SYSTEM IMPACT STUDY
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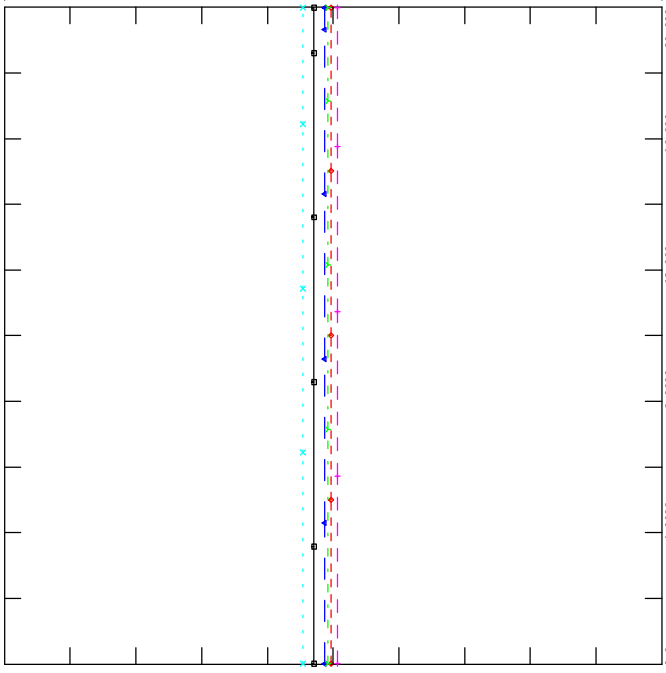
FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0101 1.0081
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0470 1.0450
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0443 1.0423
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0516 1.0496
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0307 1.0287
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0097 1.0077



SCENARIO: P2122 SYSTEM IMPACT STUDY
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FRI, JAN 31 2020 11:13

ACTIVE POWER

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CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.0660 1.9660
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0290 2.9290
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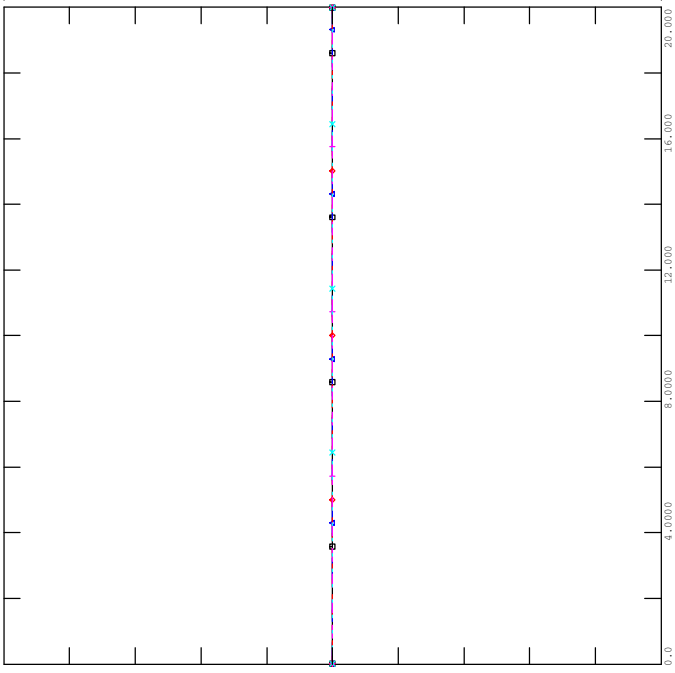

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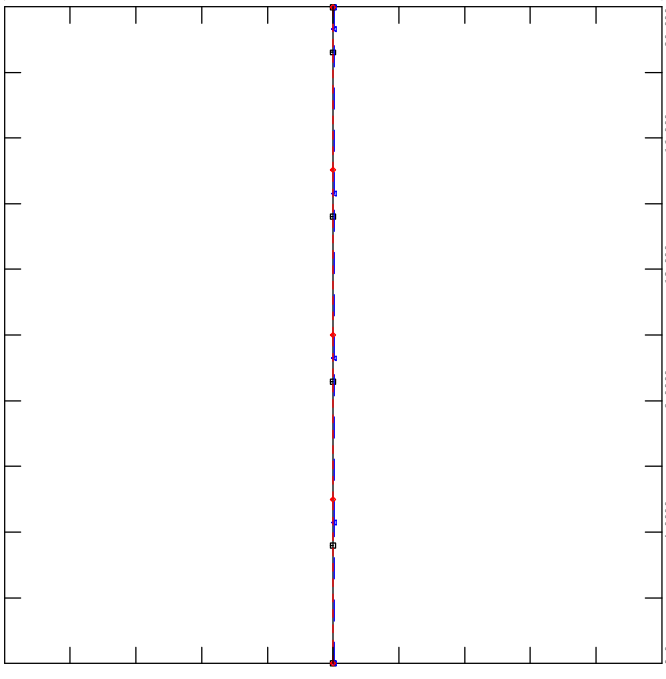
FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0410 1.0390
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.88680 0.78680
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.0660 1.9660



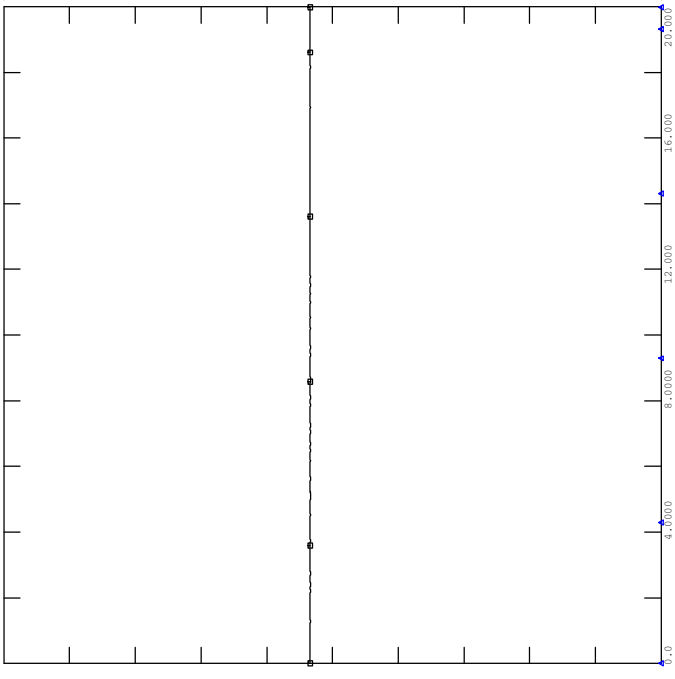
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_00_NOFAULT

FILE: Scn3_SP_00_NoFault.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 1.0910 0.09090
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -10.27 -11.27



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FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 237.18 237.08
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -348.6 -348.7
CHNL# 37: [POWR 662 TO 720 CKT '64'] 42.812 42.712
CHNL# 35: [POWR 669 TO 720 CKT '64'] -234.7 -234.8
CHNL# 33: [POWR 477 TO 662 CKT '83'] -153.0 -153.1
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 153.08 152.98

TIME (SECONDS)

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_00_NOFAULT

FILE: Scn3_SP_00_NoFault.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] -11.68 -11.78
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 263.53 263.43

TIME (SECONDS)

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SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_00_NOFAULT

FILE: Scn3_SP_00_NoFault.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.88680 0.78680
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.08350 -0.0165
CHNL# 11: [VARS 773[SECST 20.000]1] -0.0749 -0.1749
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.26300 0.16300

TIME (SECONDS)

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SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_00_NOFAULT

FILE: Scn3_SP_00_NoFault.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

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CHNL# 40: [VARS 669 TO 547004 CKT '74'] -25.62 -25.72
CHNL# 38: [VARS 662 TO 720 CKT '64'] 8.1651 8.0650
CHNL# 36: [VARS 669 TO 720 CKT '64'] 10.389 10.289
CHNL# 34: [VARS 477 TO 662 CKT '83'] 27.796 27.696
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -4.588 -4.688

TIME (SECONDS)

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

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1.1257 0.43890

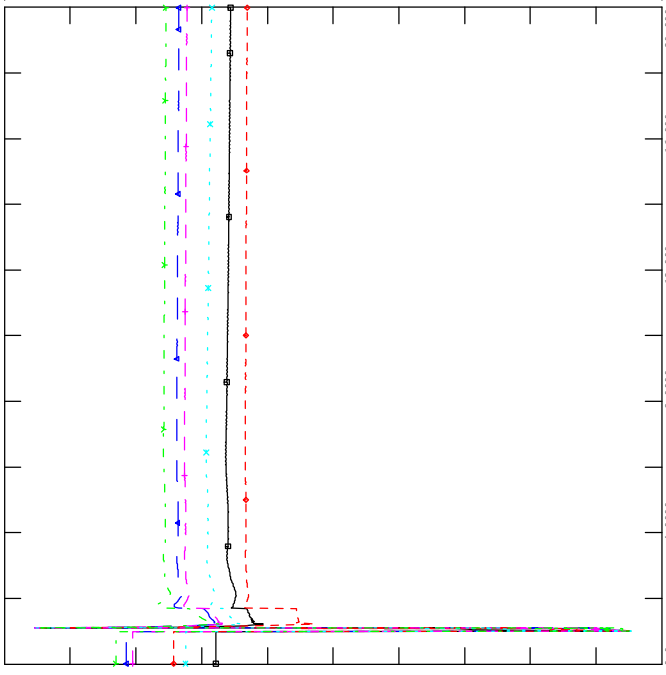
CHNL# 26: [VOLT 918 [CASS01 240.00]]
1.1628 0.73890

CHNL# 25: [VOLT 669 [BOWMAN1 240.00]]
1.2360 0.24920

CHNL# 24: [VOLT 662 [WHITLA1 240.00]]
1.4202 -0.0171

CHNL# 23: [VOLT 659 [BOWMAN2 138.00]]
1.1885 0.33300

CHNL# 22: [VOLT 645 [BOWMAN3 138.00]]
1.1091 0.79710



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ACTIVE POWER

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0.05000 -0.0500

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2.2300 0.23500

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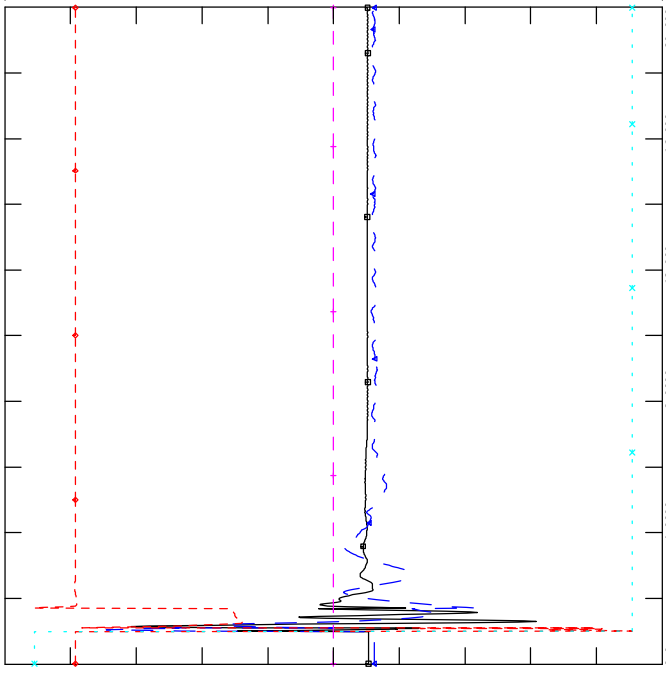


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

FILE: Scn3_SP_01_1074L_Elkwater.out

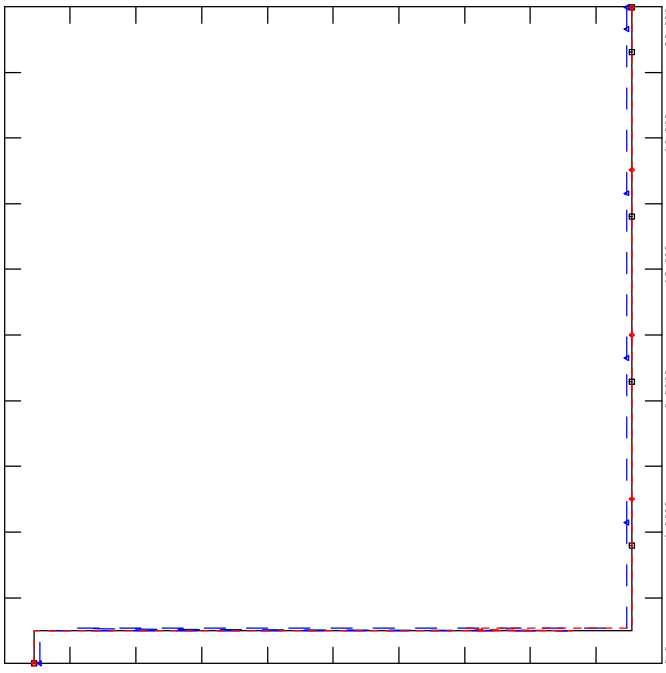
FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1]
1.0920 -0.0520

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
0.88680 -0.0500

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.1168 -0.1008



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

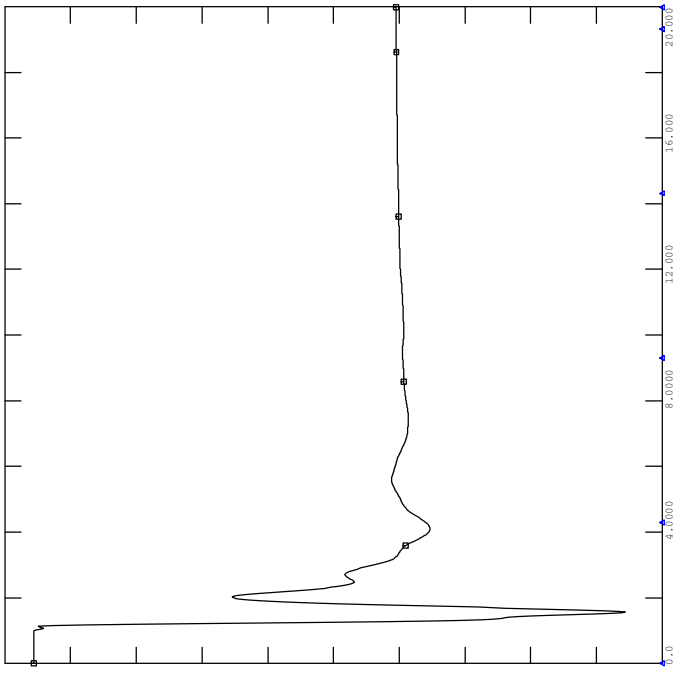
FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1]
1.8290 -4.412

CHNL# 1: [ANGL 713[CMH 14 13.800]14]
-9.878 -29.49



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
249.94 -31.79

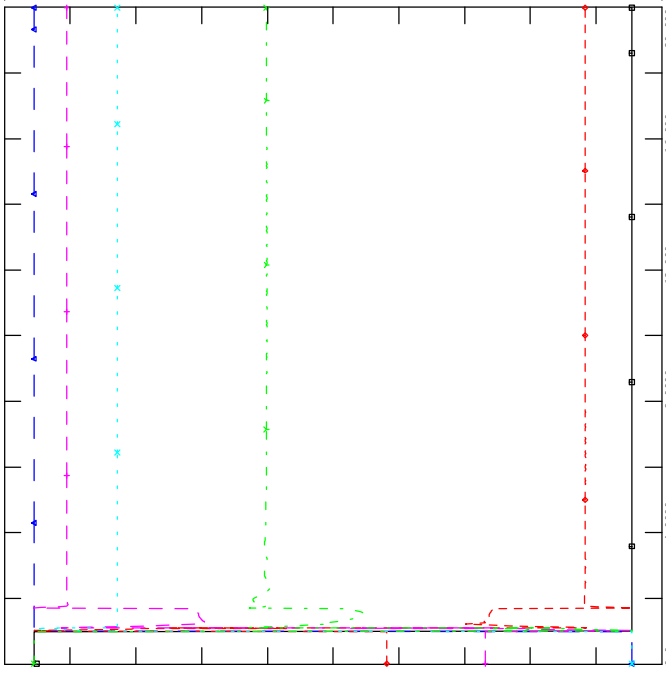
CHNL# 39: [POWR 669 TO 547004 CKT '74']
76.528 -368.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
216.76 -21.29

CHNL# 35: [POWR 669 TO 720 CKT '64']
38.554 -431.2

CHNL# 33: [POWR 477 TO 662 CKT '83']
7.6521 -160.7

CHNL# 31: [POWR 477 TO 547004 CKT '74']
16068. -765.1



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

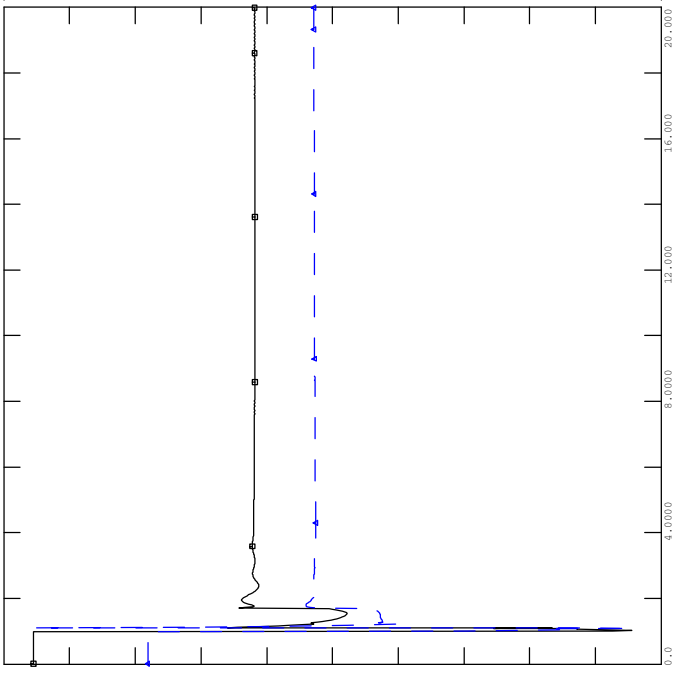
FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
55.971 -253.2

CHNL# 43: [POWR 669 TO 1012 CKT '35']
277.23 -25.31



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

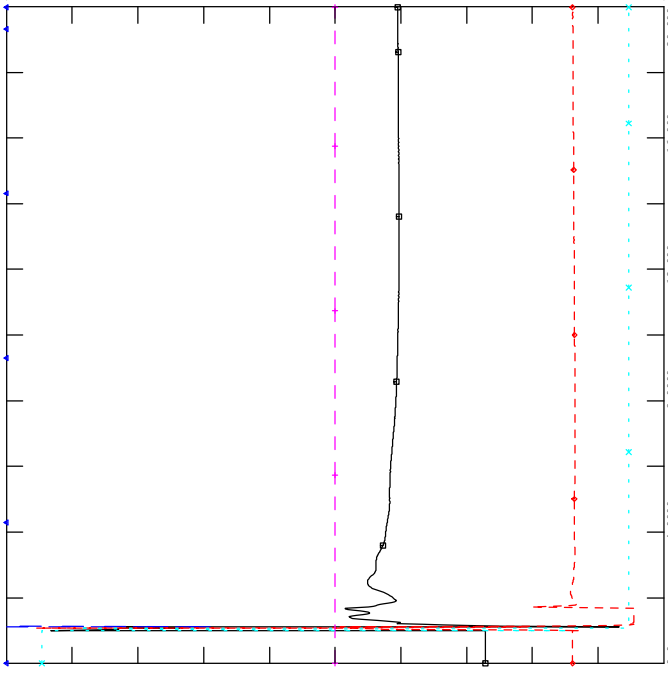
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
0.88680 -0.0500

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.3710 -0.3431

CHNL# 11: [VARS 773[SECST 20.000]1]
0.51530 -0.5325

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.75100 0.01240



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_01_1074L_ELKWATER

FILE: Scn3_SP_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
51.526 -252.4

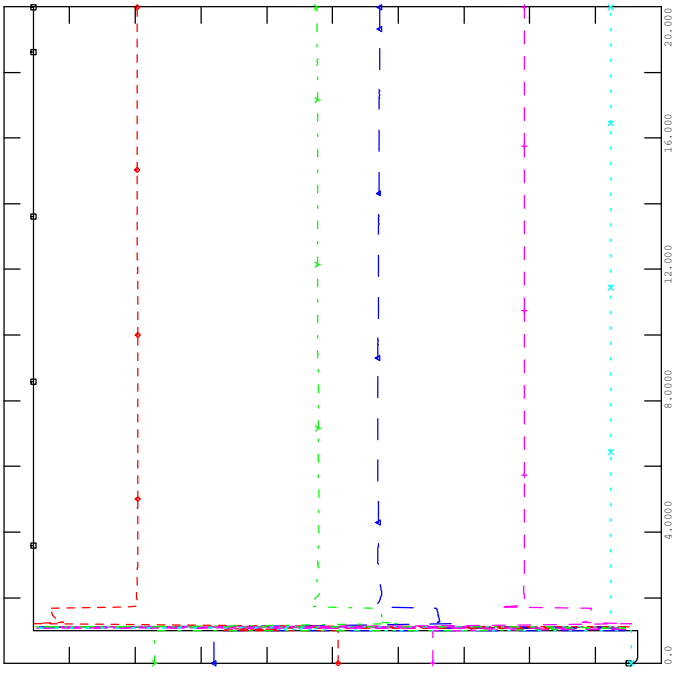
CHNL# 40: [VARS 669 TO 547004 CKT '74']
763.21 -63.23

CHNL# 38: [VARS 662 TO 720 CKT '64']
197.98 -92.80

CHNL# 36: [VARS 669 TO 720 CKT '64']
293.89 -263.6

CHNL# 34: [VARS 477 TO 662 CKT '83']
41.822 -2.069

CHNL# 32: [VARS 477 TO 547004 CKT '74']
20.181 -423.8



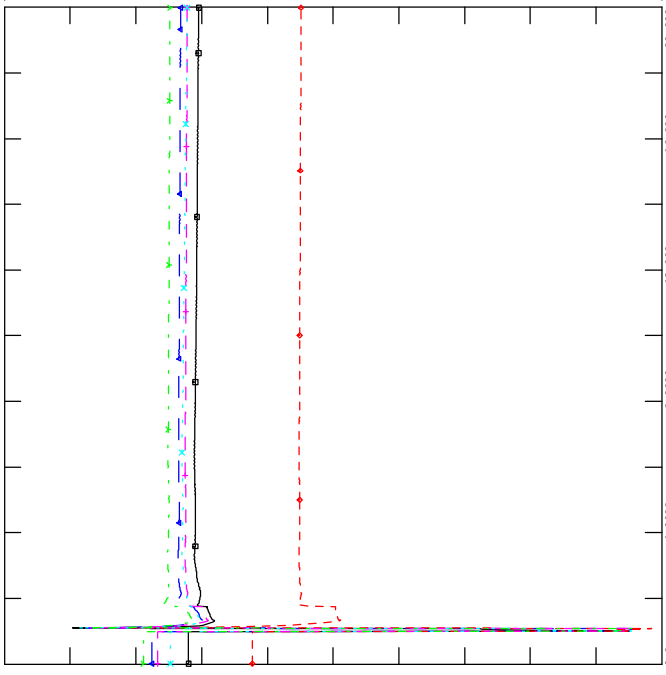
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]1] 1.2303 0.18630
CHNL# 26: [VOLT 918 [CASS01 240.00]1] 1.1939 0.60900
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]1] 1.3782 -0.0607
CHNL# 24: [VOLT 662 [WHITLA1 240.00]1] 1.6943 -0.0133
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]1] 1.3136 0.04920
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]1] 1.1259 0.70780



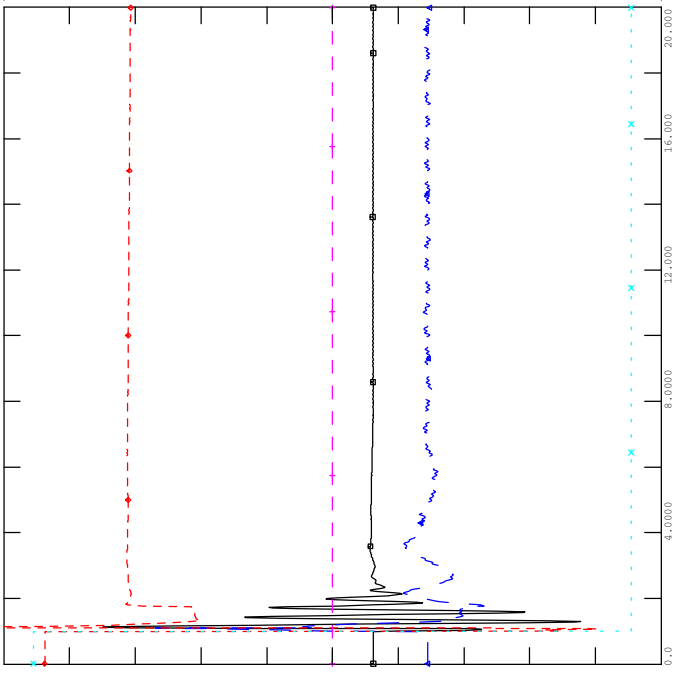
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1169 -0.1008
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.1380 0.17600
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2816 2.8124
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.56760 0.08820



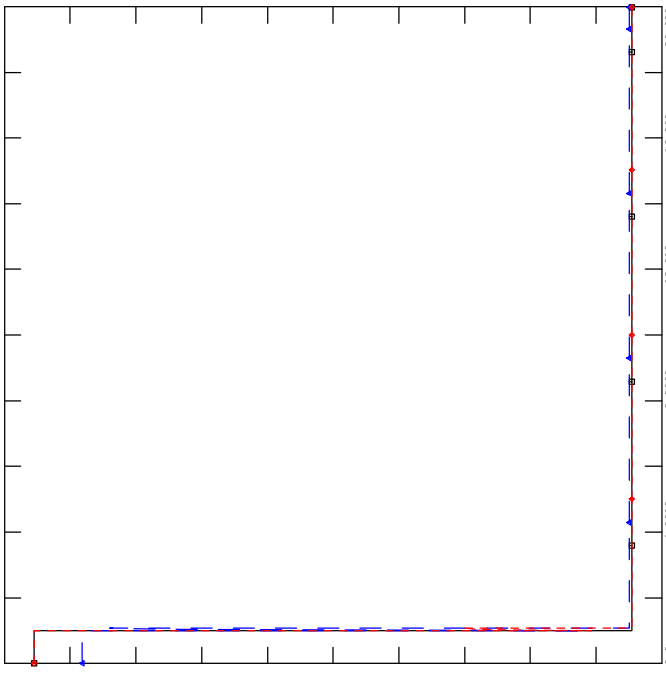
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0921 -0.0520
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.95550 -0.0500
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1169 -0.1008



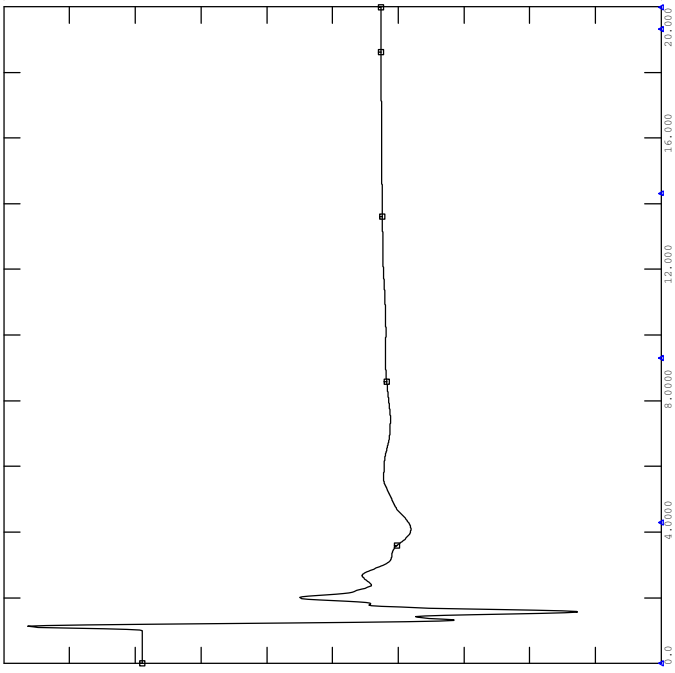
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.1606 -4.712
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -4.343 -34.68



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
249.04 -12.68

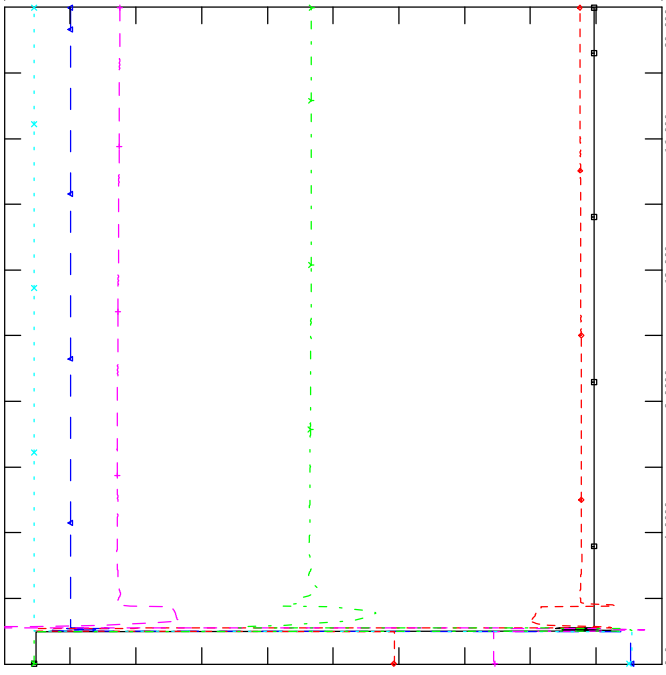
CHNL# 39: [POWR 669 TO 547004 CKT '74']
1743.2 -36607

CHNL# 37: [POWR 662 TO 720 CKT '64']
210.47 -14.82

CHNL# 35: [POWR 669 TO 720 CKT '64']
20.395 -409.8

CHNL# 33: [POWR 477 TO 662 CKT '83']
18.104 -161.6

CHNL# 31: [POWR 477 TO 547004 CKT '74']
161.63 -18.61



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

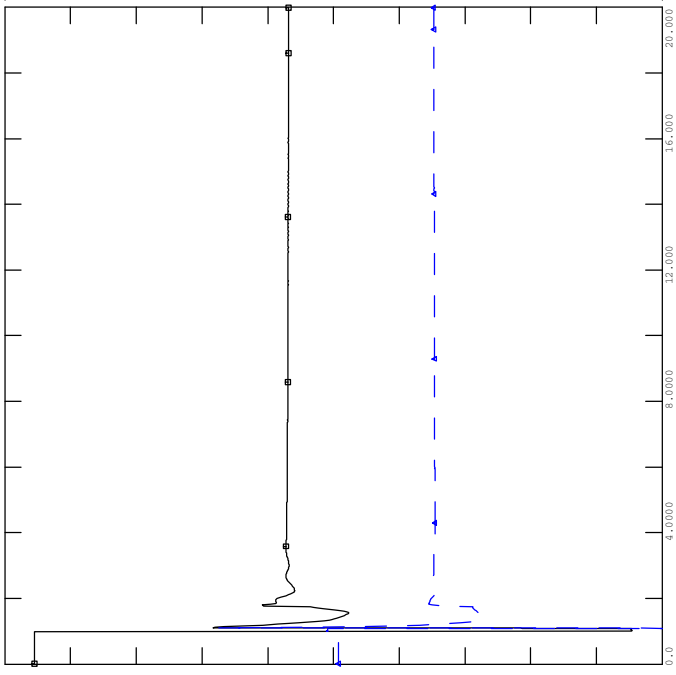
FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
215.14 -232.0

CHNL# 43: [POWR 669 TO 1012 CKT '35']
276.70 -13.85



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

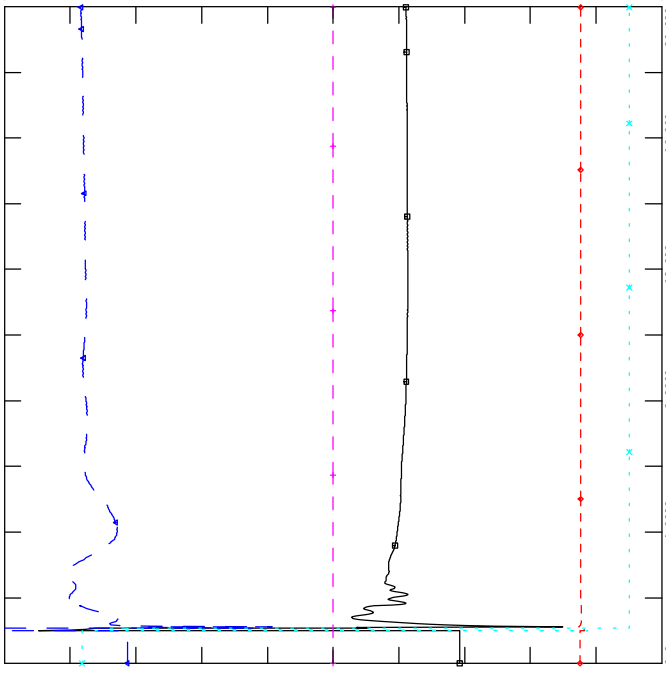
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
0.95550 -0.0500

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
3.6089 -0.4744

CHNL# 11: [VARS 773[SECST 20.000]1]
0.81340 -0.5574

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.88430 -0.0856



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_02_1074L_BOWMANTON

FILE: Scn3_SP_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
208.80 -230.2

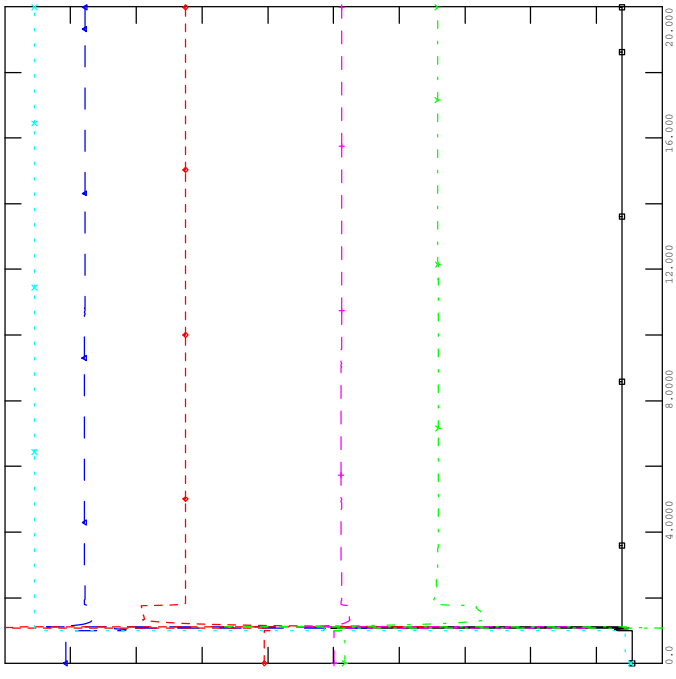
CHNL# 40: [VARS 669 TO 547004 CKT '74']
100.91 -2119.

CHNL# 38: [VARS 662 TO 720 CKT '64']
448.33 -431.3

CHNL# 36: [VARS 669 TO 720 CKT '64']
456.79 -673.5

CHNL# 34: [VARS 477 TO 662 CKT '83']
58.643 -274.6

CHNL# 32: [VARS 477 TO 547004 CKT '74']
274.02 -17.91



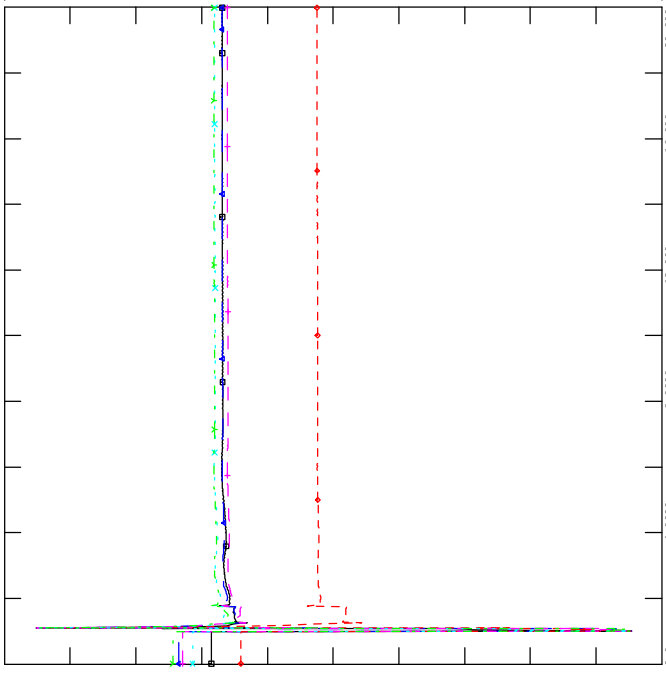
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.2061 0.43710
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1688 0.73980
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3387 0.24720
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.6569 -0.0276
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2814 0.33110
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1055 0.79800



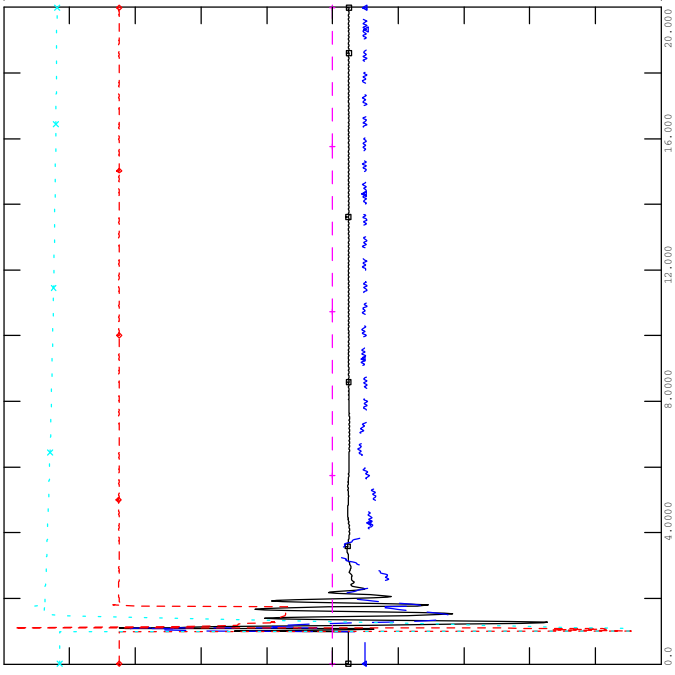
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2125 -0.1054
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3961 0.22590
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2243 2.7774
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.45490 0.15570



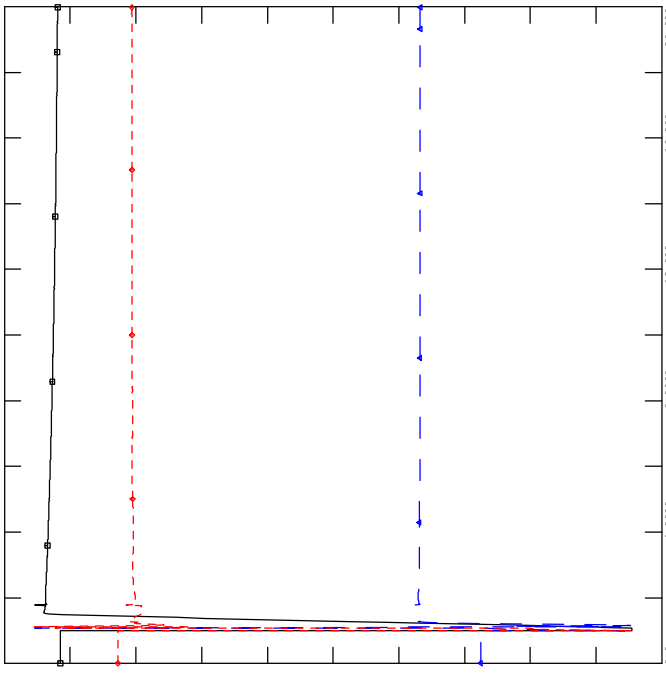
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2453 0.05350
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 3.3106 -0.1060
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2125 -0.1054



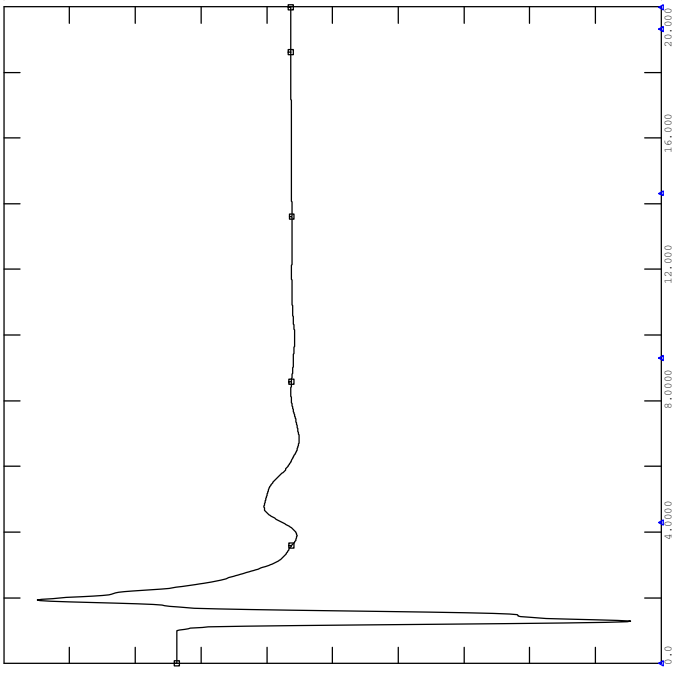
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.7838 -3.292
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -6.117 -23.67



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
256.71 -32.76

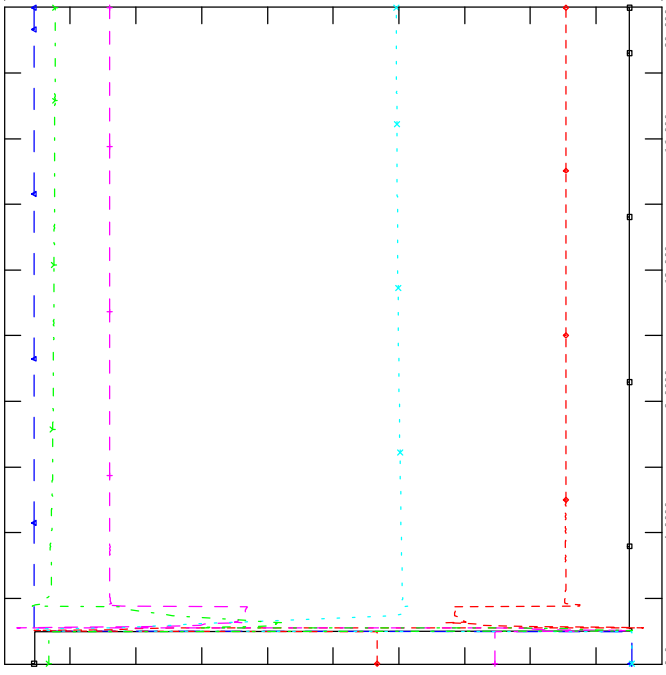
CHNL# 39: [POWR 669 TO 547004 CKT '74']
54.994 -368.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
234.72 -22.76

CHNL# 35: [POWR 669 TO 720 CKT '64']
40.456 -445.1

CHNL# 33: [POWR 477 TO 662 CKT '83']
765.17 -16069

CHNL# 31: [POWR 477 TO 547004 CKT '74']
160.90 -8.321



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

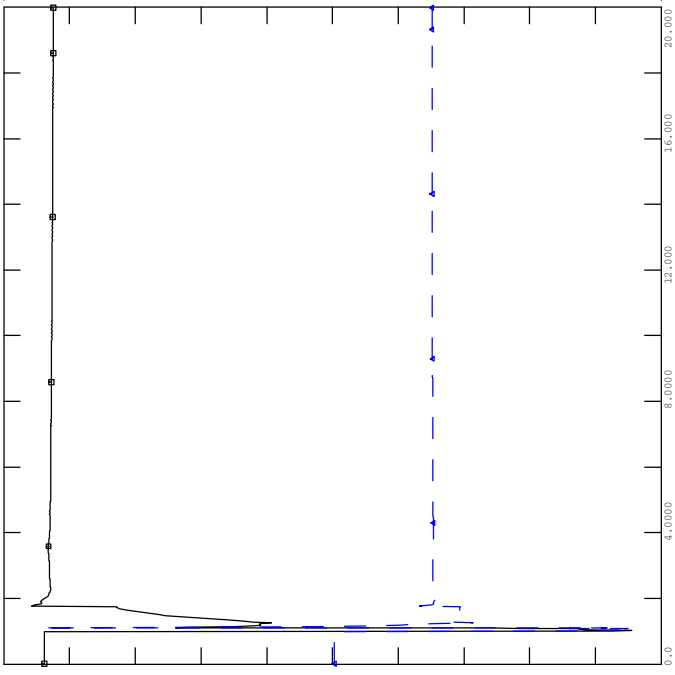
FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
204.09 -225.4

CHNL# 43: [POWR 669 TO 1012 CKT '35']
282.45 -26.13



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

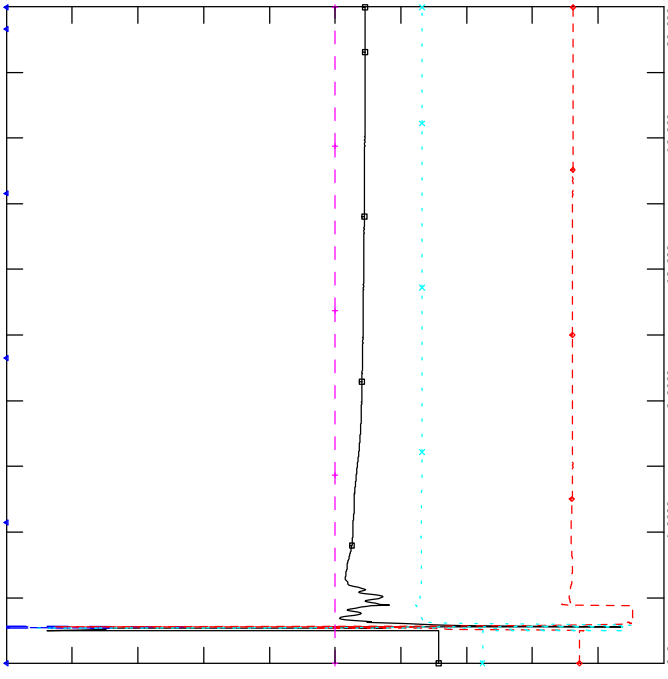
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
3.3106 -0.1060

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
3.4507 -0.4696

CHNL# 11: [VARS 773[SECST 20.000]1]
0.51260 -0.4678

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.74960 -0.0669



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_03_983L_ELKWATER

FILE: Scn3_SP_03_983L_Elkwater.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
196.42 -223.9

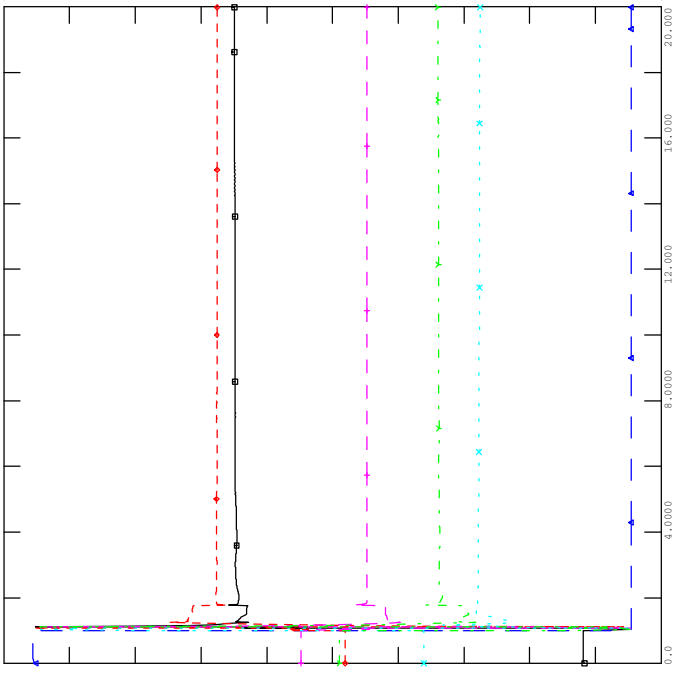
CHNL# 40: [VARS 669 TO 547004 CKT '74']
446.62 -292.6

CHNL# 38: [VARS 662 TO 720 CKT '64']
344.71 -399.4

CHNL# 36: [VARS 669 TO 720 CKT '64']
621.16 -554.9

CHNL# 34: [VARS 477 TO 662 CKT '83']
3909.0 -186.1

CHNL# 32: [VARS 477 TO 547004 CKT '74']
37.173 -10.30



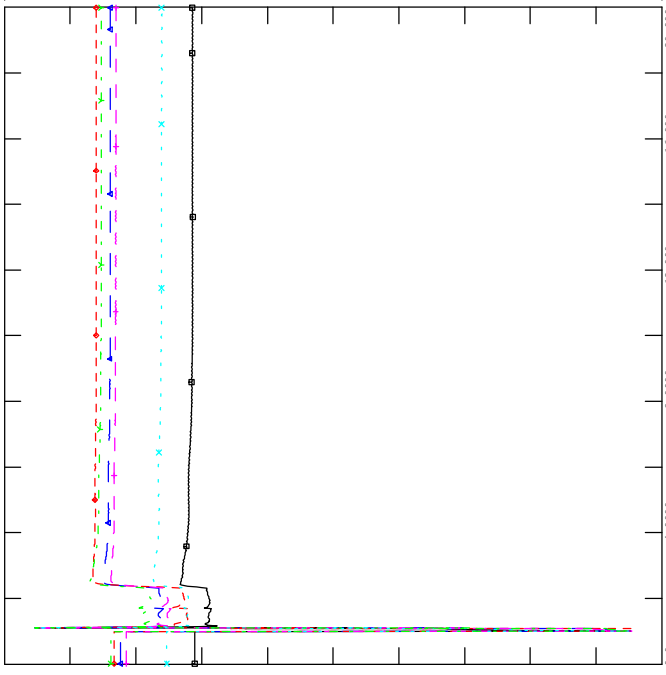
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1007 0.53630
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1282 0.79580
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1931 0.38610
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2727 -0.0589
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1538 0.45240
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0791 0.83620



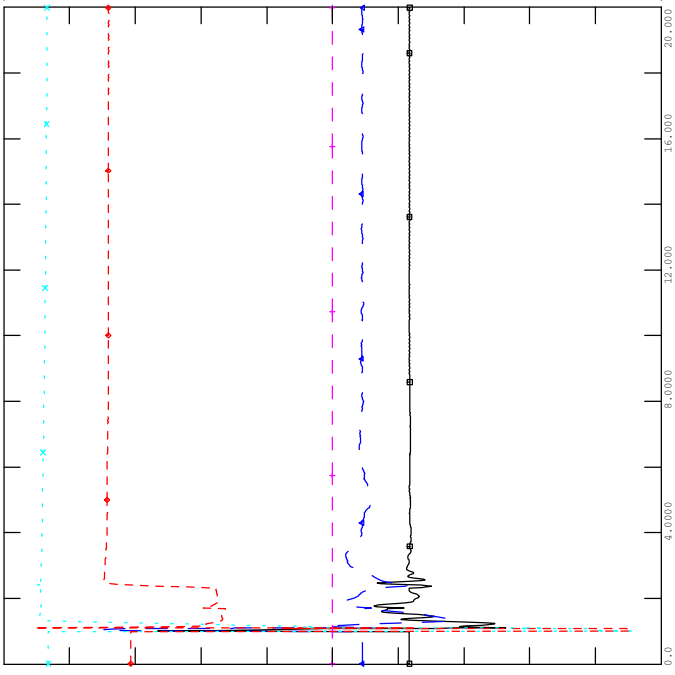
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1705 -0.1034
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.4317 0.27700
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2018 2.7931
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.42990 0.21610



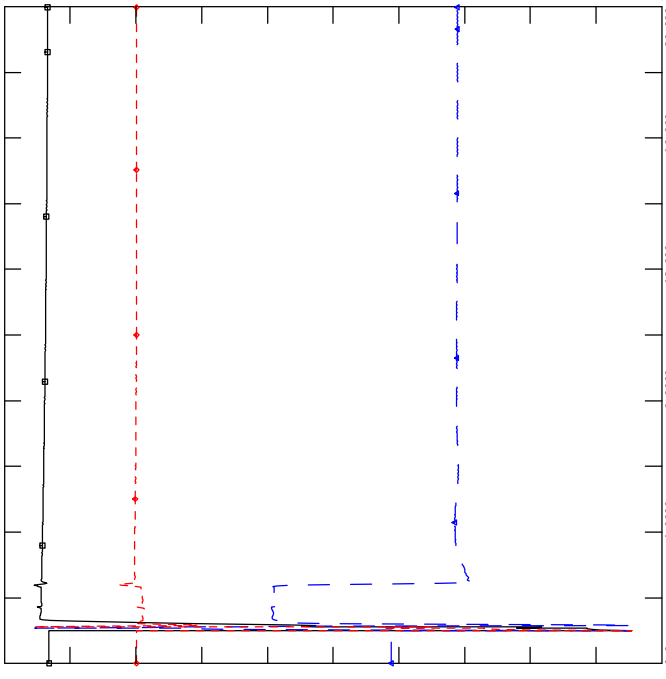
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2286 0.28990
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7637 0.18760
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1705 -0.1034



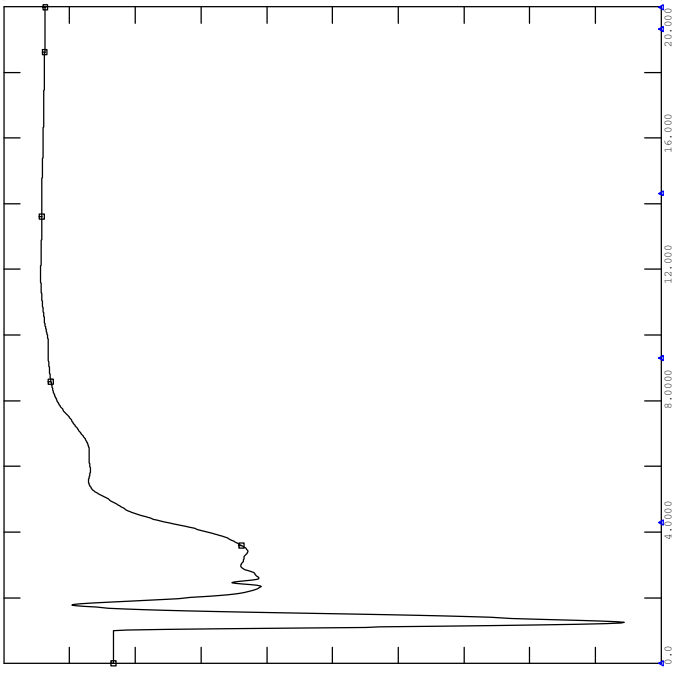
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2979 -2.101
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -9.337 -17.71



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
261.53 -31.11

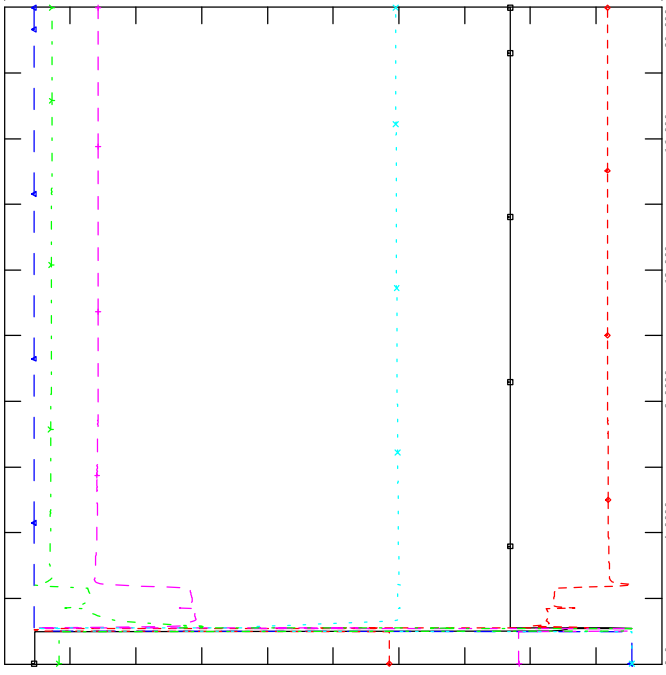
CHNL# 39: [POWR 669 TO 547004 CKT '74']
52.056 -367.8

CHNL# 37: [POWR 662 TO 720 CKT '64']
239.70 -12.09

CHNL# 35: [POWR 669 TO 720 CKT '64']
44.529 -432.7

CHNL# 33: [POWR 477 TO 662 CKT '83']
7.7290 -162.3

CHNL# 31: [POWR 477 TO 547004 CKT '74']
162.77 -48.86



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

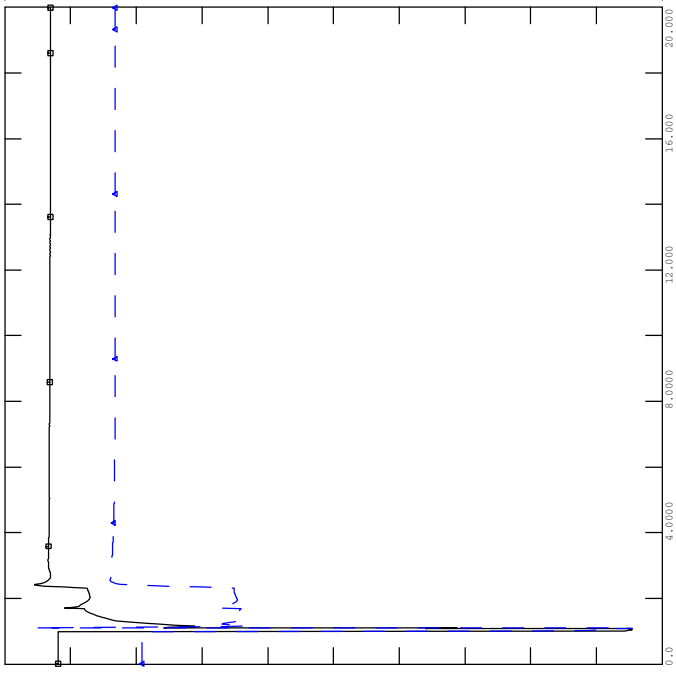
FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
52.890 -257.3

CHNL# 43: [POWR 669 TO 1012 CKT '35']
288.51 -20.85



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

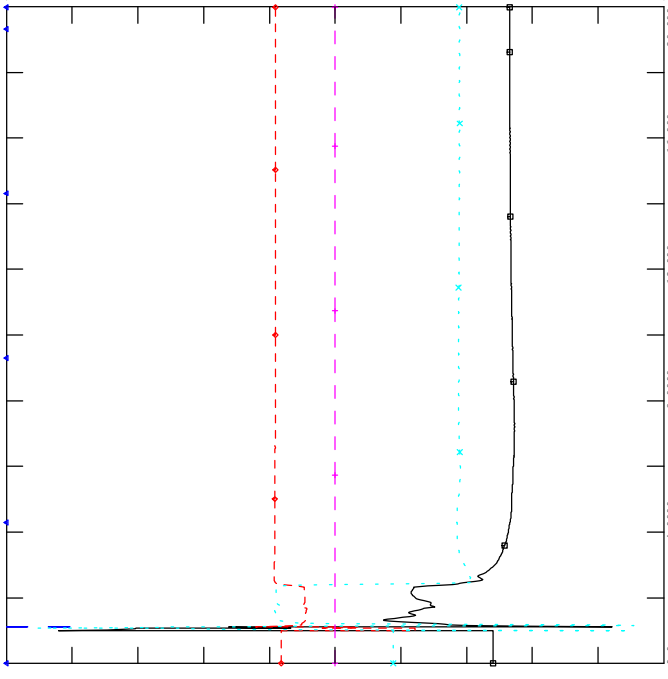
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.7637 0.18760

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.08880 -0.0438

CHNL# 11: [VARS 773[SECST 20.000]1]
0.39240 -0.3974

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.68320 0.04770



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_04_983L_WHITLA

FILE: Scn3_SP_04_983L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
46.611 -255.9

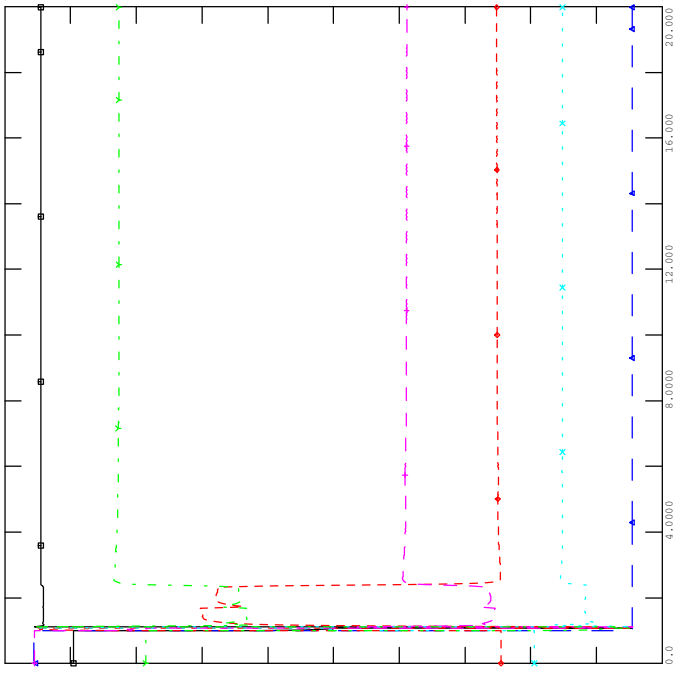
CHNL# 40: [VARS 669 TO 547004 CKT '74']
640.29 -186.3

CHNL# 38: [VARS 662 TO 720 CKT '64']
10.966 -51.63

CHNL# 36: [VARS 669 TO 720 CKT '64']
320.62 -90.53

CHNL# 34: [VARS 477 TO 662 CKT '83']
29.627 -1.411

CHNL# 32: [VARS 477 TO 547004 CKT '74']
55.587 -523.5



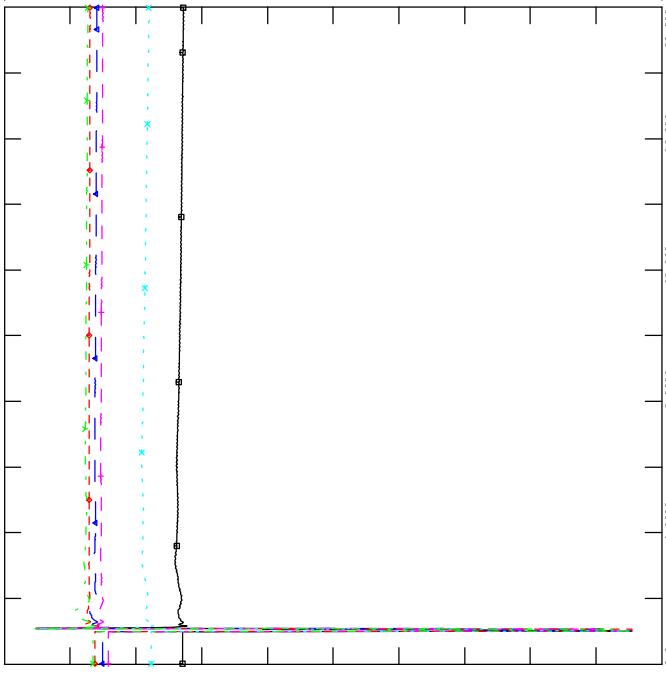
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0825 0.53720
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1179 0.79630
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1665 0.38750
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2281 -0.0582
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1306 0.45360
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0727 0.83650



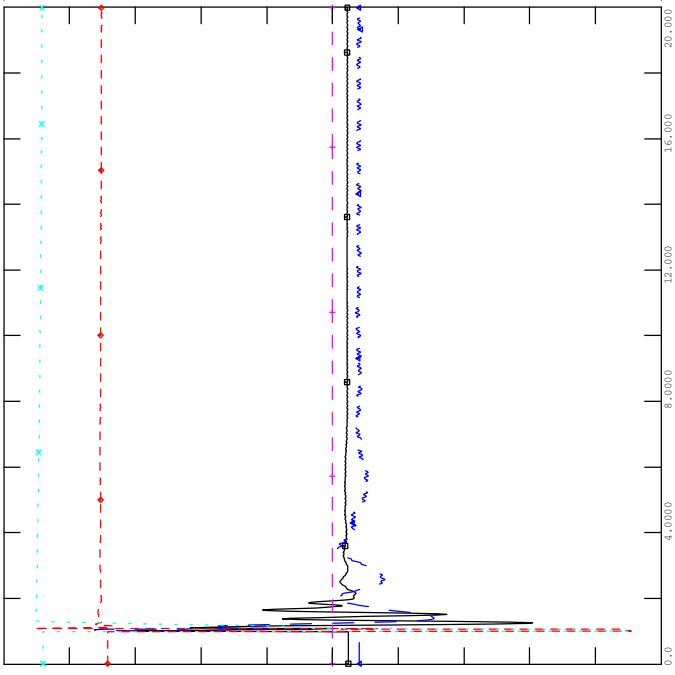
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1514 -0.1024
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3430 0.27880
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1966 2.7944
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.43020 0.17790



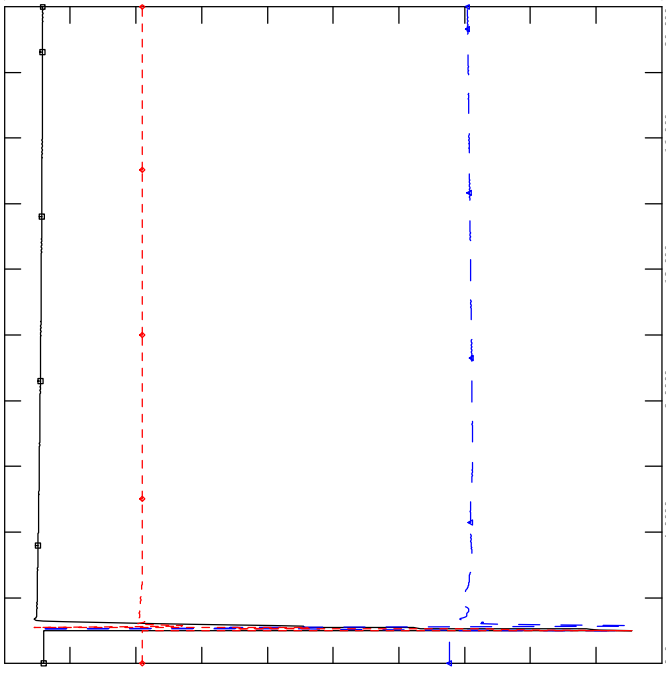
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2389 0.29060
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.3064 0.13580
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1514 -0.1024



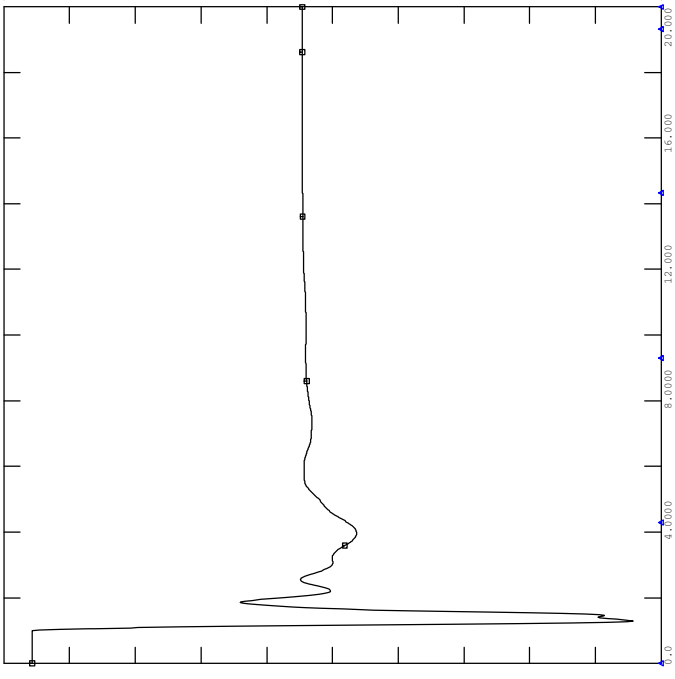
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 1.7258 -3.752
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -10.03 -26.25



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
249.89 -30.79

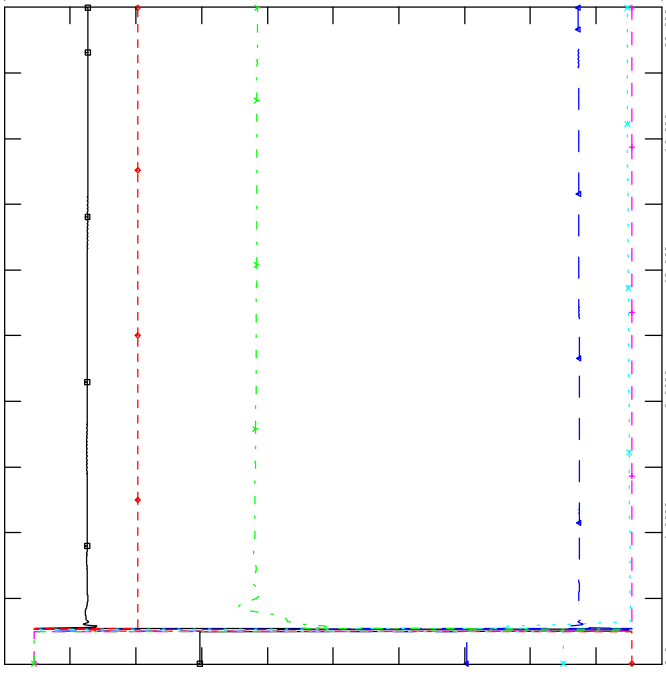
CHNL# 39: [POWR 669 TO 547004 CKT '74']
37.367 -416.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
4490.0 -213.8

CHNL# 35: [POWR 669 TO 720 CKT '64']
63.487 -249.0

CHNL# 33: [POWR 477 TO 662 CKT '83']
30.136 -230.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
230.49 -30.14



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

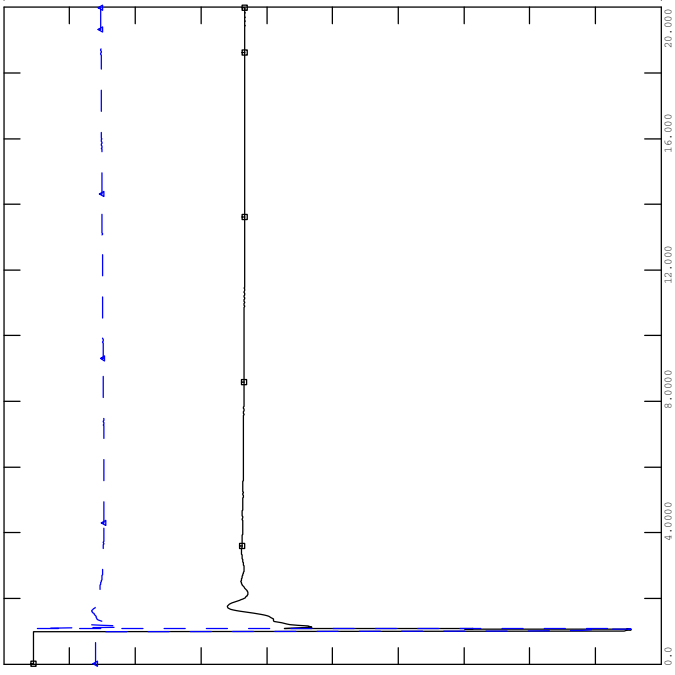
FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
28.171 -257.9

CHNL# 43: [POWR 669 TO 1012 CKT '35']
277.00 -20.52



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

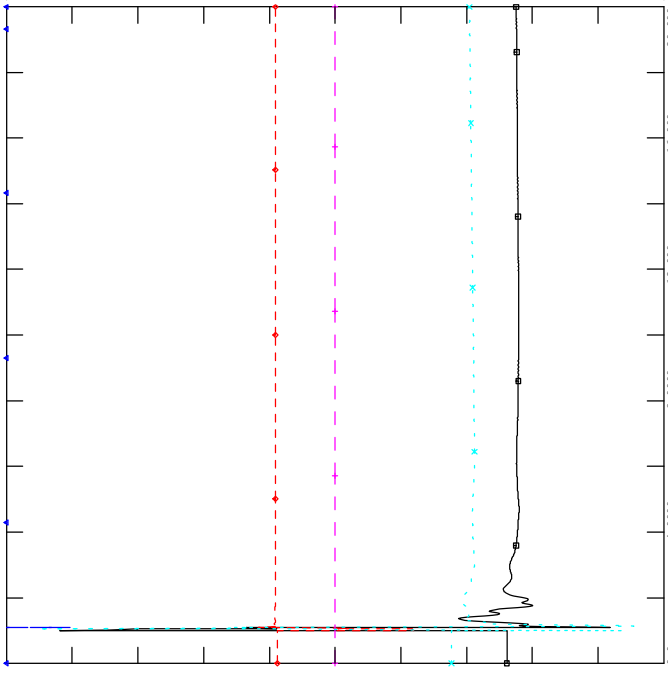
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.3064 0.13580

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.08740 -0.0438

CHNL# 11: [VARS 773[SECST 20.000]1]
0.39230 -0.3970

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.68310 0.06540



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_05_964L_WHITLA

FILE: Scn3_SP_05_964L_Whitla.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
23.631 -256.3

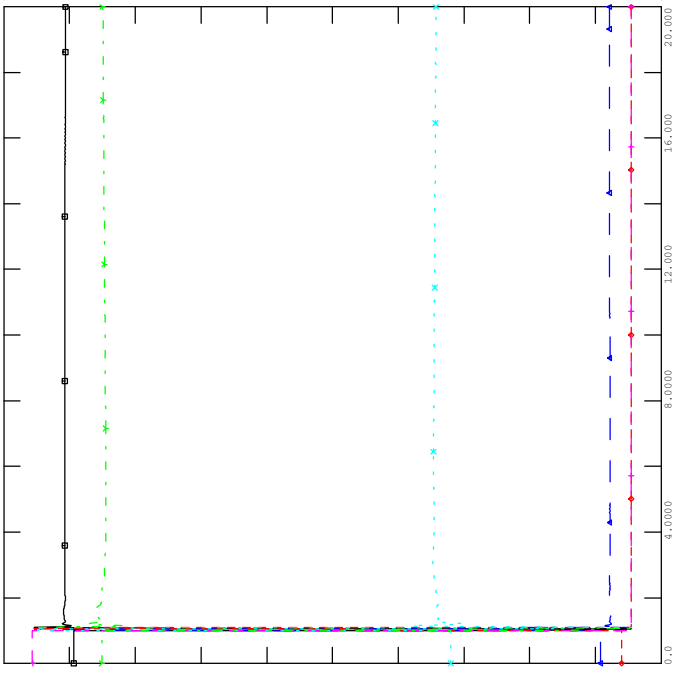
CHNL# 40: [VARS 669 TO 547004 CKT '74']
255.83 -158.2

CHNL# 38: [VARS 662 TO 720 CKT '64']
970.63 -46.22

CHNL# 36: [VARS 669 TO 720 CKT '64']
670.86 -31.95

CHNL# 34: [VARS 477 TO 662 CKT '83']
244.44 5.7418

CHNL# 32: [VARS 477 TO 547004 CKT '74']
23.849 -243.7



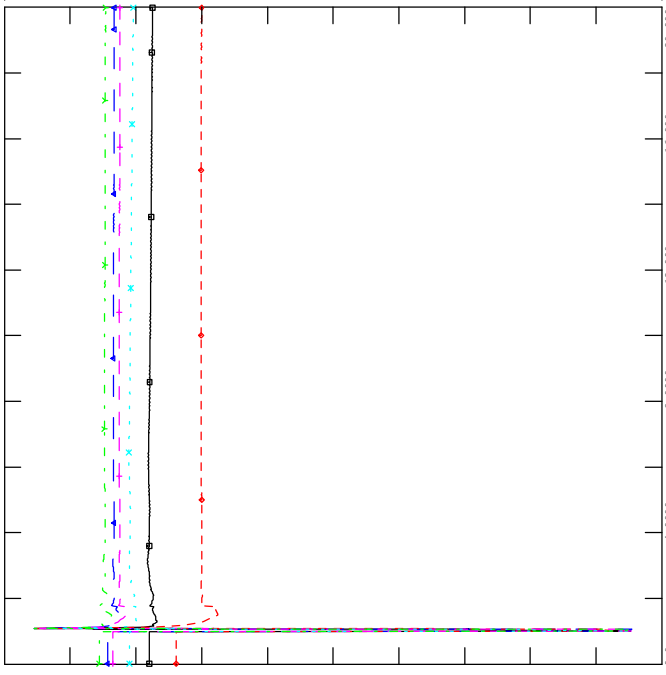
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1455 0.20040
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1473 0.61450
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2589 -0.0473
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.4240 -0.0029
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2092 0.06440
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0926 0.71170



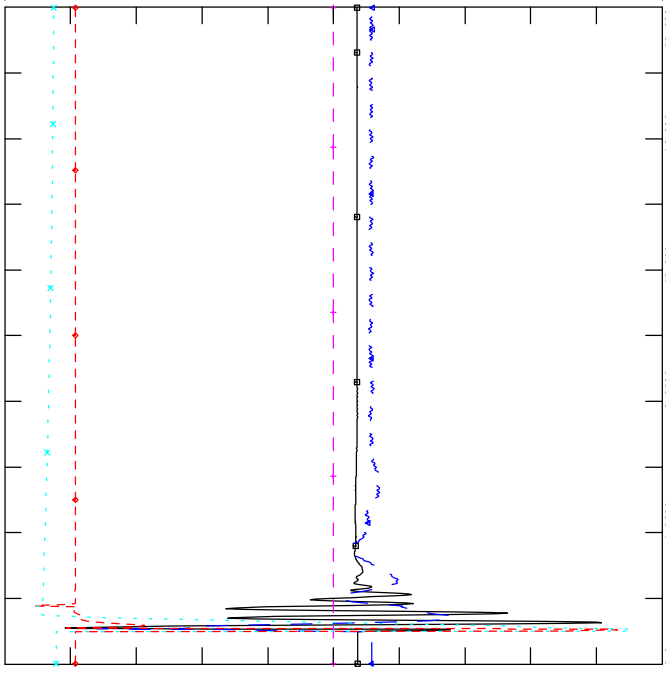
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1959 -0.1046
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2365 0.17990
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2951 2.7285
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.58590 0.04940



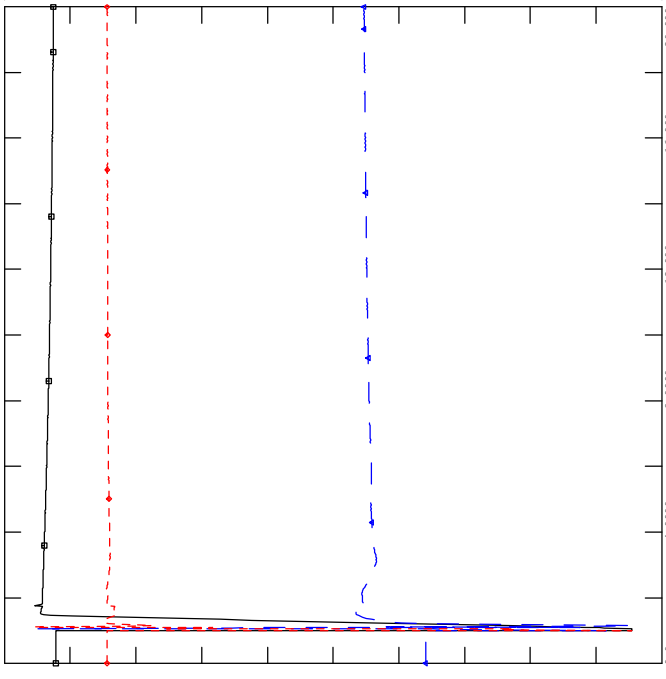
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2284 0.02320
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.6272 -0.1678
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1959 -0.1046



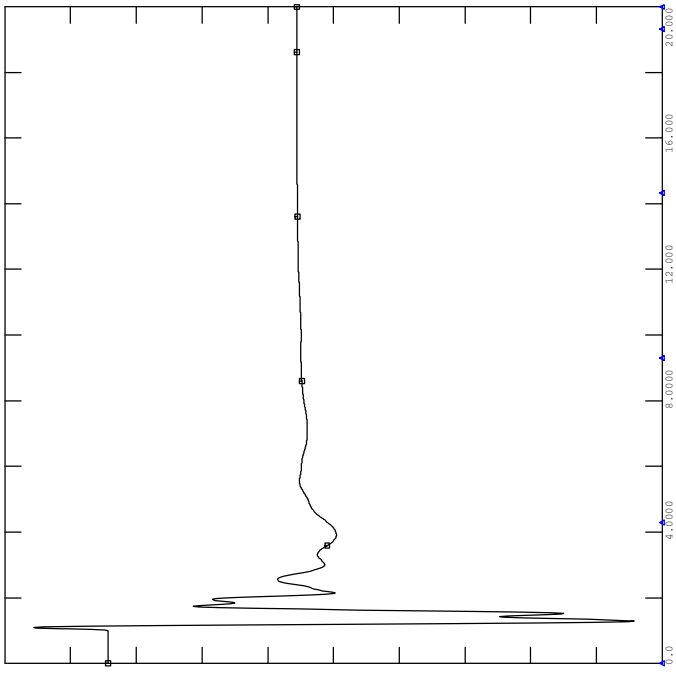
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.4448 -5.019
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -6.480 -33.59



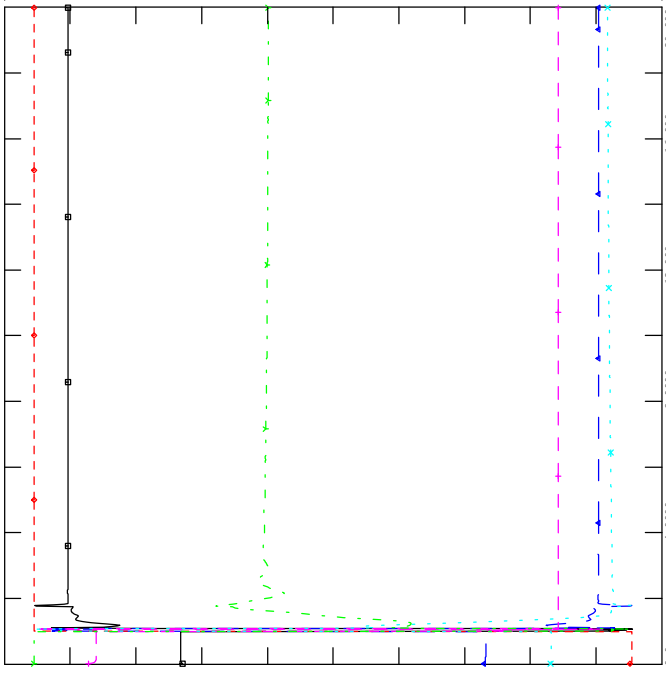
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 249.45 -21.36
CHNL# 39: [POWR 669 TO 547004 CKT '74'] 40.390 -427.2
CHNL# 37: [POWR 662 TO 720 CKT '64'] 51.247 -9.600
CHNL# 35: [POWR 669 TO 720 CKT '64'] 1173.9 -24652
CHNL# 33: [POWR 477 TO 662 CKT '83'] 18.401 -215.8
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 215.82 -18.40



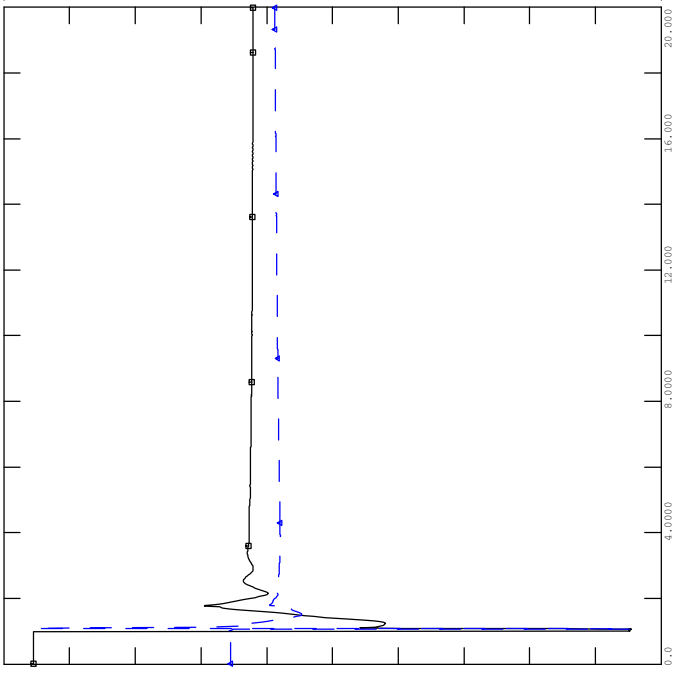
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 97.489 -219.1
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 276.73 -14.64



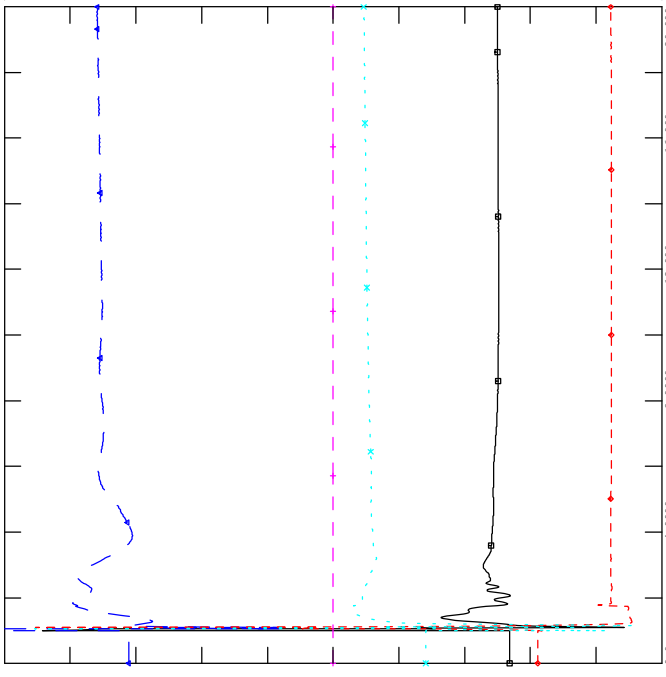
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.6272 -0.1678
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 3.1365 -0.6870
CHNL# 11: [VARS 773[SECST 20.000]1] 0.80310 -0.4987
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.88140 0.01150



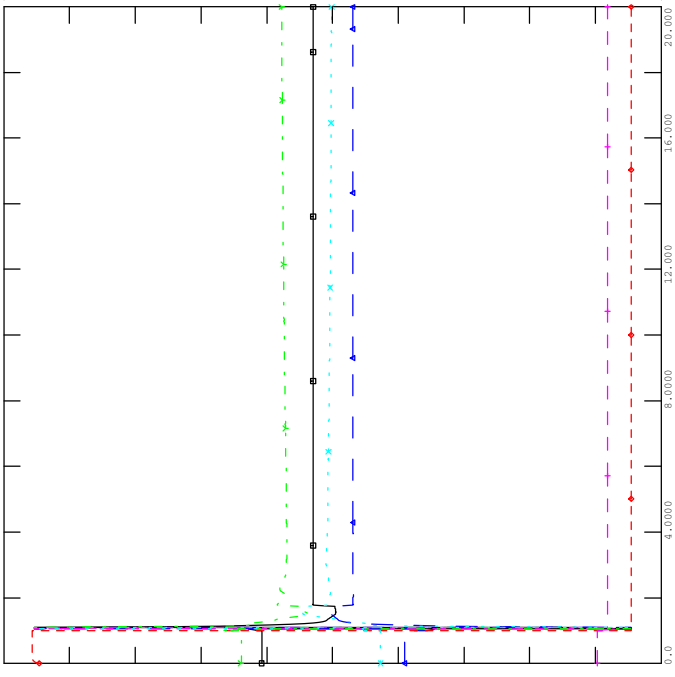
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_06_964L_BOWMANTON

FILE: Scn3_SP_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 93.782 -216.5
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 425.69 -362.2
CHNL# 38: [VARS 662 TO 720 CKT '64'] 475.55 -42.49
CHNL# 36: [VARS 669 TO 720 CKT '64'] 2592.3 -123.4
CHNL# 34: [VARS 477 TO 662 CKT '83'] 562.99 -314.5
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 349.25 -552.9



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

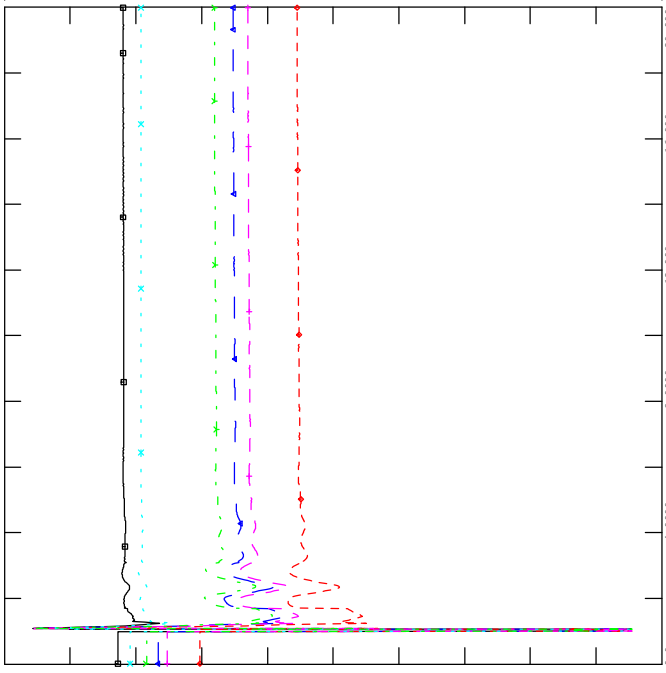
FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.2014 0.31130
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.2996 -0.0240
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3324 0.16640
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.4012 0.22240
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2768 0.22080
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1638 0.26440

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

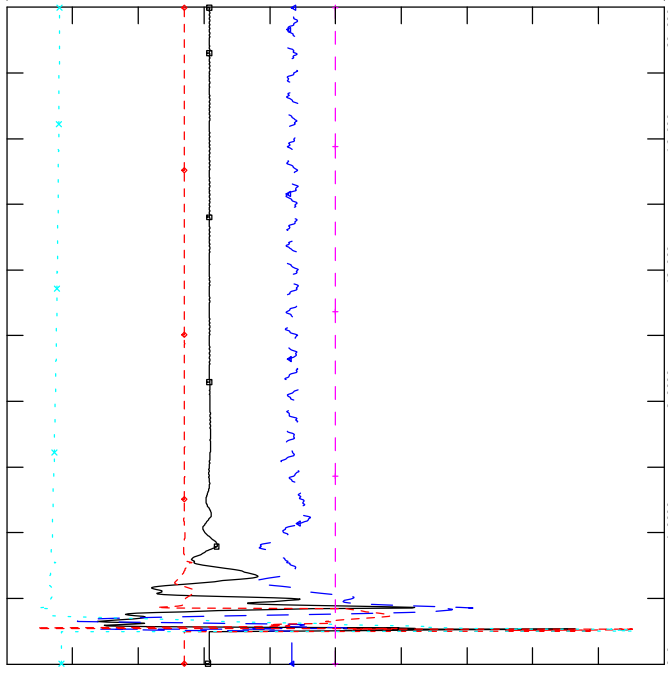
FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2086 -0.1052
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5516 0.56960
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2389 2.6397
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.41210 0.04160

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

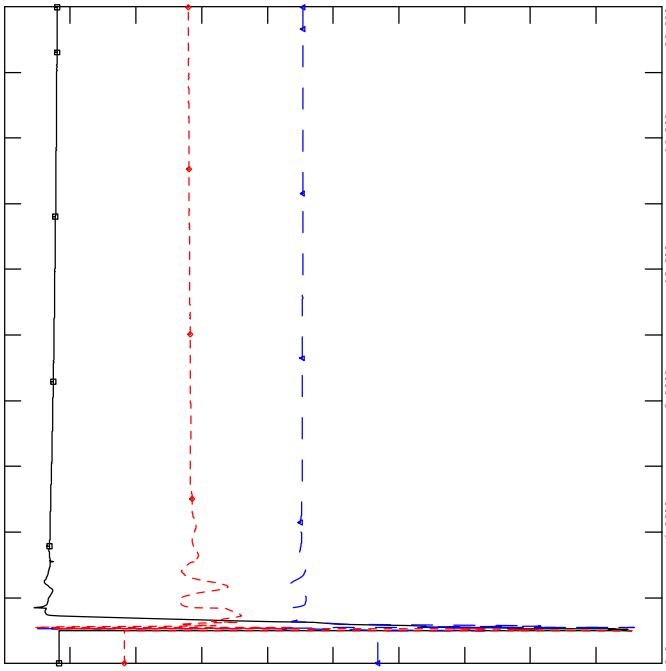
FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2138 0.26290
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.9194 -0.7485
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2086 -0.1052

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

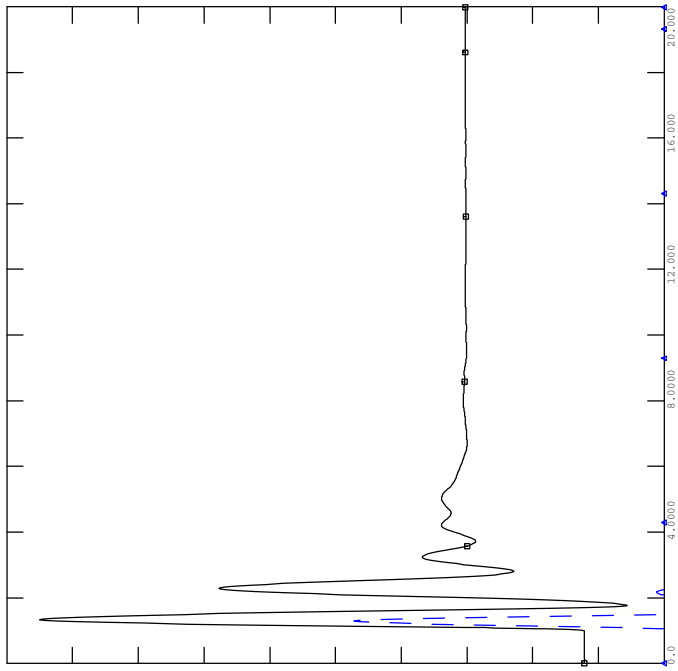
FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 11.680 -8.399
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 31.017 -16.52

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
251.51 -11.98

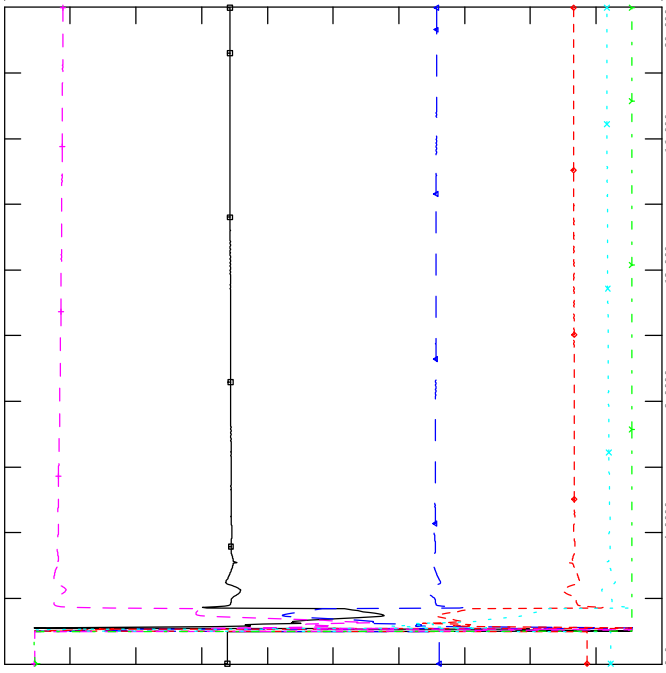
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-1.337 -377.8

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.159 -7.346

CHNL# 35: [POWR 669 TO 720 CKT '64']
-10.72 -263.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
-14.06 -224.3

CHNL# 31: [POWR 477 TO 547004 CKT '74']
224.26 14.065



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

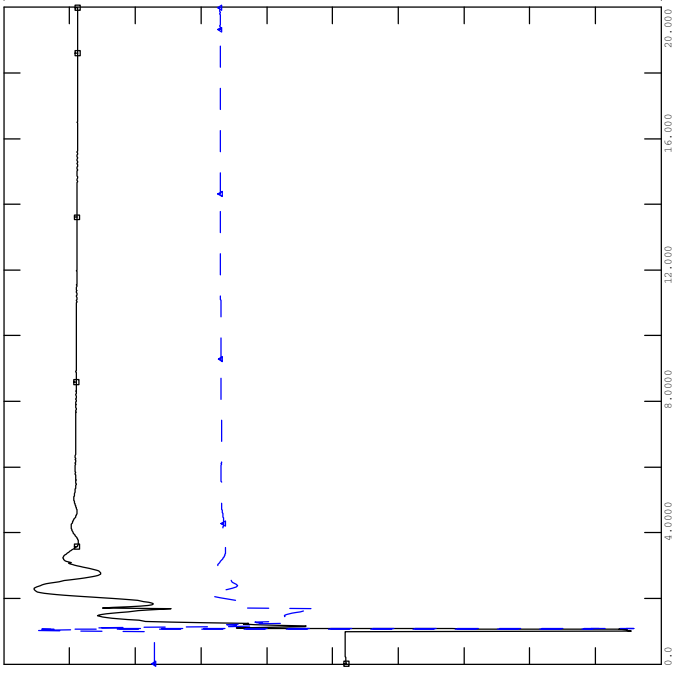
FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
93.448 -366.0

CHNL# 43: [POWR 669 TO 1012 CKT '35']
568.47 -18.55



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

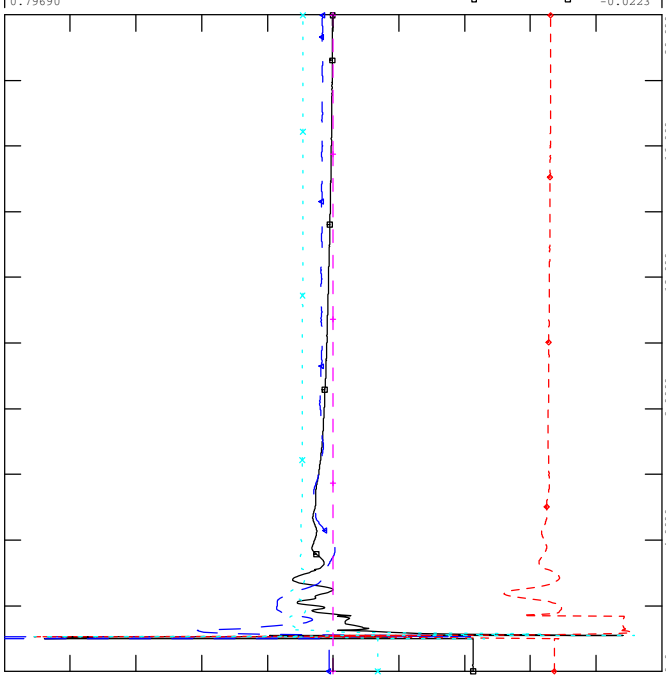
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.9194 -0.7485

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.2485 -0.4010

CHNL# 11: [VARS 773[SECST 20.000]1]
1.9595 -0.8812

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.79690 -0.0223



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_07_1034L_CASSILS

FILE: Scn3_SP_07_1034L_Cassils.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
0.90200 -18.94

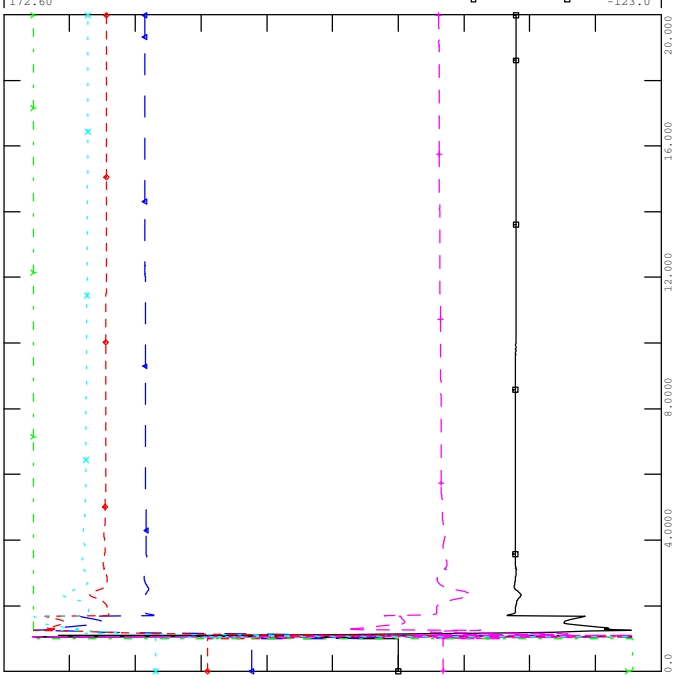
CHNL# 40: [VARS 669 TO 547004 CKT '74']
74.536 -359.2

CHNL# 38: [VARS 662 TO 720 CKT '64']
47.668 -11.46

CHNL# 36: [VARS 669 TO 720 CKT '64']
119.36 -232.2

CHNL# 34: [VARS 477 TO 662 CKT '83']
136.21 -151.2

CHNL# 32: [VARS 477 TO 547004 CKT '74']
172.60 -123.0



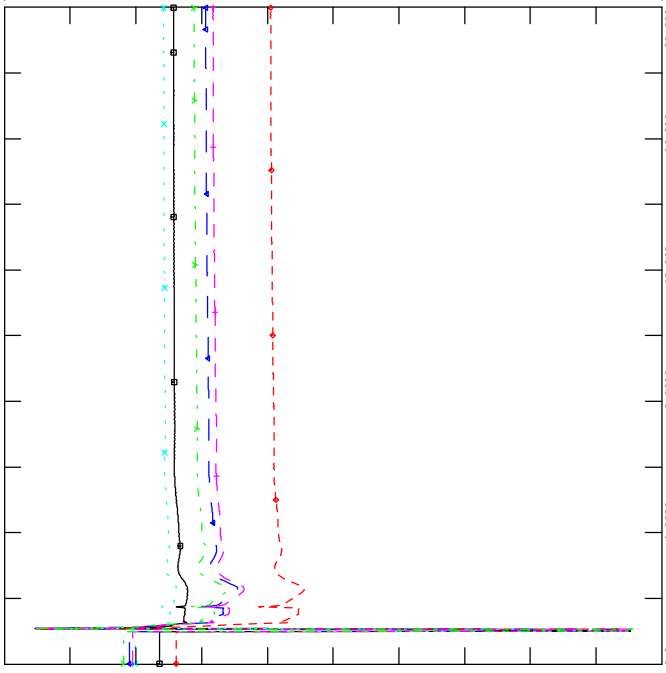
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1901 0.19240
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1543 0.60930
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3095 -0.0534
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.4236 -0.0038
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2582 0.05470
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1016 0.70790



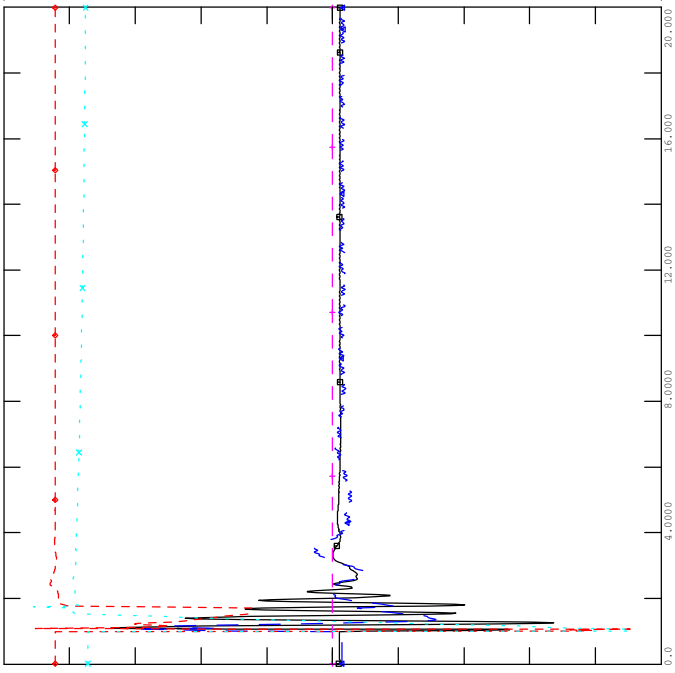
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3287 -0.1109
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.1676 0.22780
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2011 2.7694
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.45280 0.14960



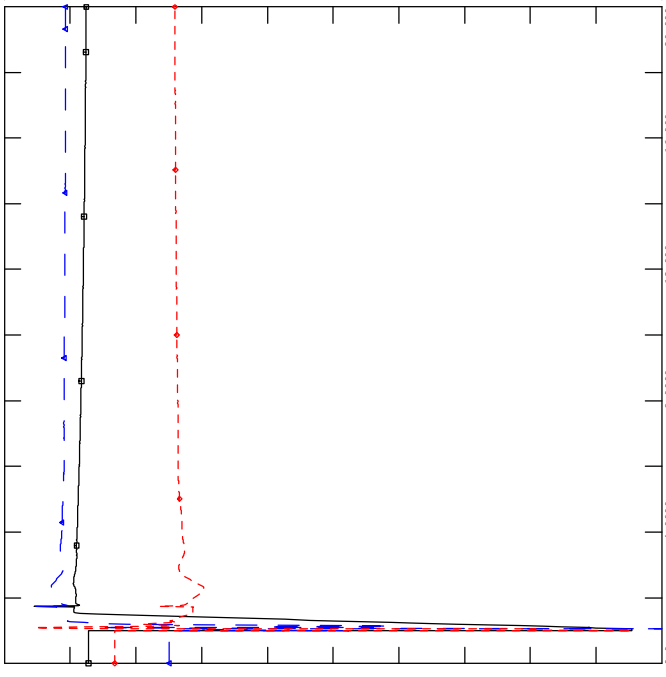
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2454 0.01980
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.5408 -1.269
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3287 -0.1109



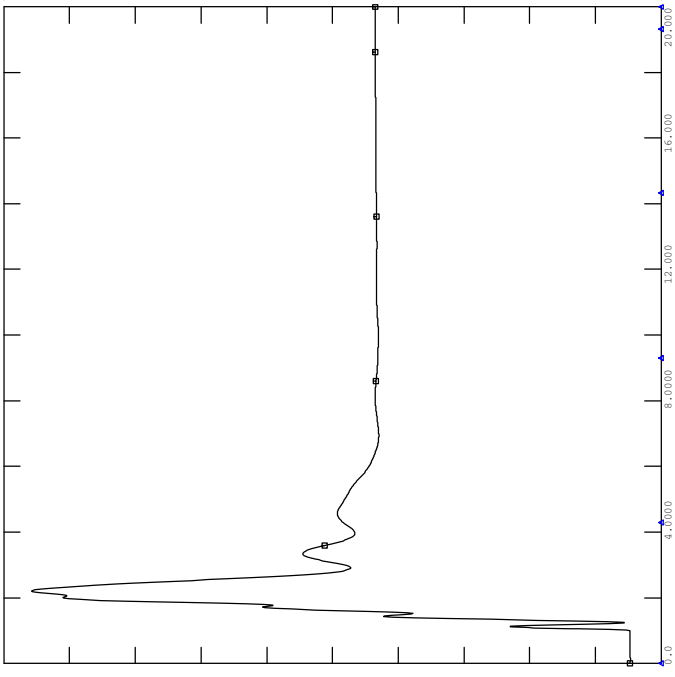
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2931 -3.094
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 10.325 -11.79



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
24898. -1186.

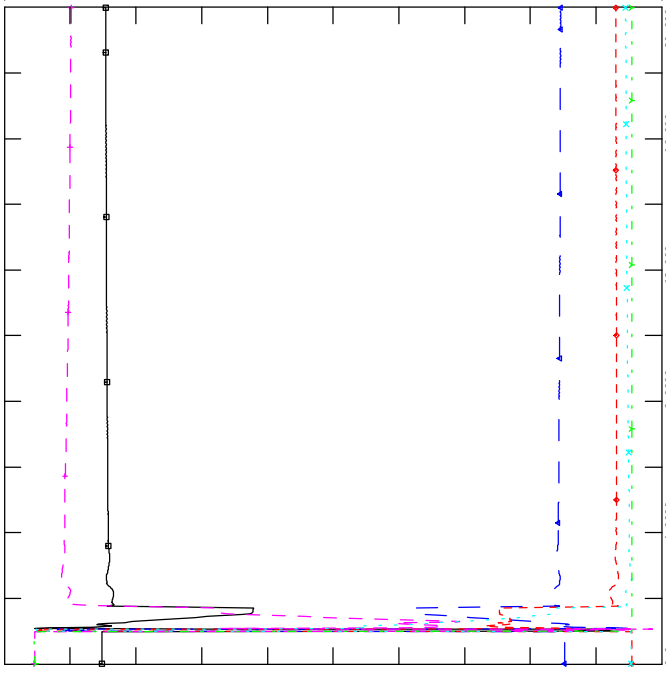
CHNL# 39: [POWR 669 TO 547004 CKT '74']
18.447 -366.8

CHNL# 37: [POWR 662 TO 720 CKT '64']
44.956 -3.137

CHNL# 35: [POWR 669 TO 720 CKT '64']
12.998 -246.6

CHNL# 33: [POWR 477 TO 662 CKT '83']
16.649 -182.6

CHNL# 31: [POWR 477 TO 547004 CKT '74']
182.56 -16.67



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

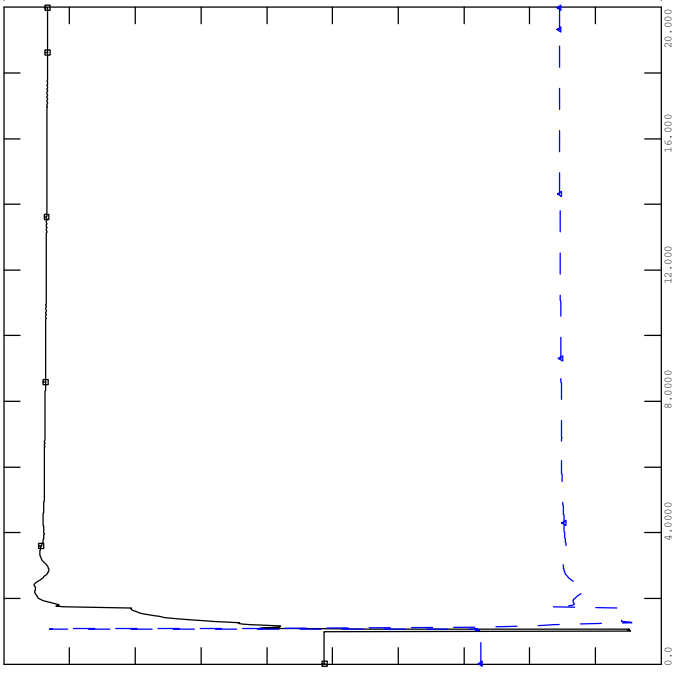
FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
343.42 -146.3

CHNL# 43: [POWR 669 TO 1012 CKT '35']
539.84 -27.62



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

REACTIVE POWER

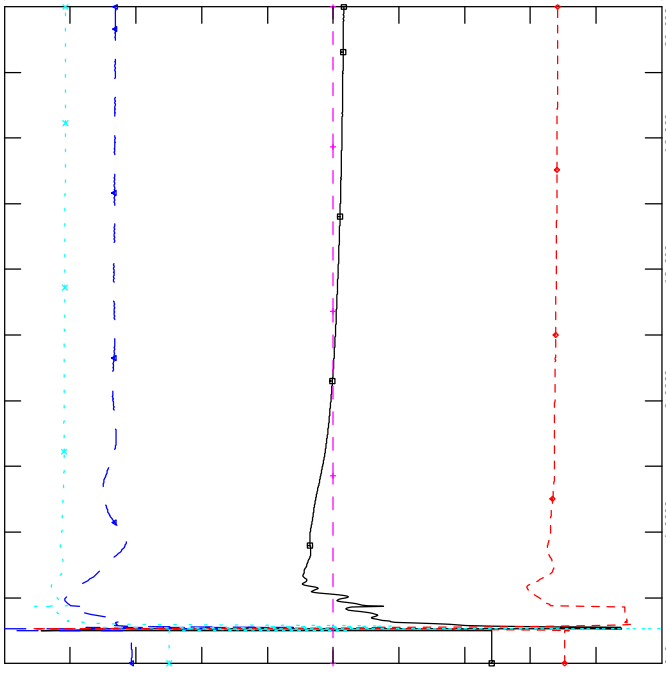
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.5408 -1.269

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
3.2943 -0.5334

CHNL# 11: [VARS 773[SECST 20.000]1]
0.81470 -0.5155

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.88280 -0.0207



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_08_1034L_BOWMANTON

FILE: Scn3_SP_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:13

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
15.079 -0.7181

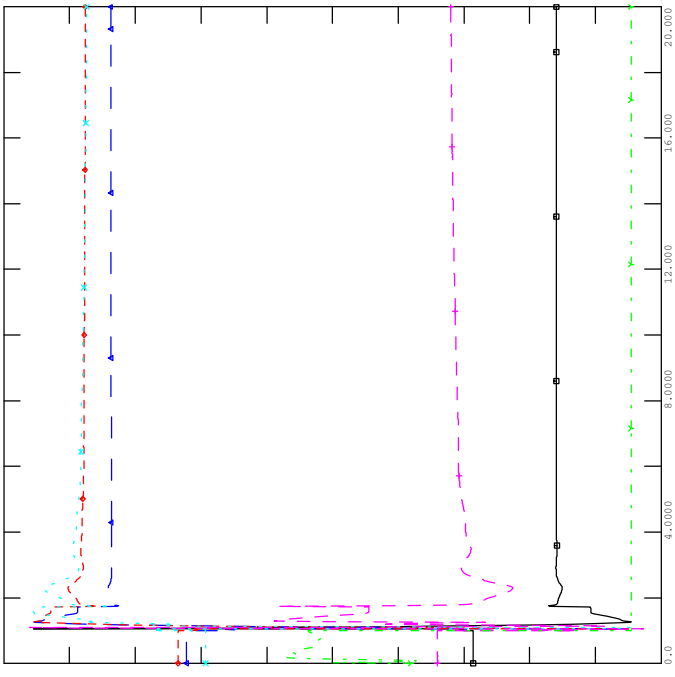
CHNL# 40: [VARS 669 TO 547004 CKT '74']
70.434 -242.9

CHNL# 38: [VARS 662 TO 720 CKT '64']
32.856 -4.600

CHNL# 36: [VARS 669 TO 720 CKT '64']
131.39 -324.7

CHNL# 34: [VARS 477 TO 662 CKT '83']
157.41 -308.7

CHNL# 32: [VARS 477 TO 547004 CKT '74']
338.95 -142.5



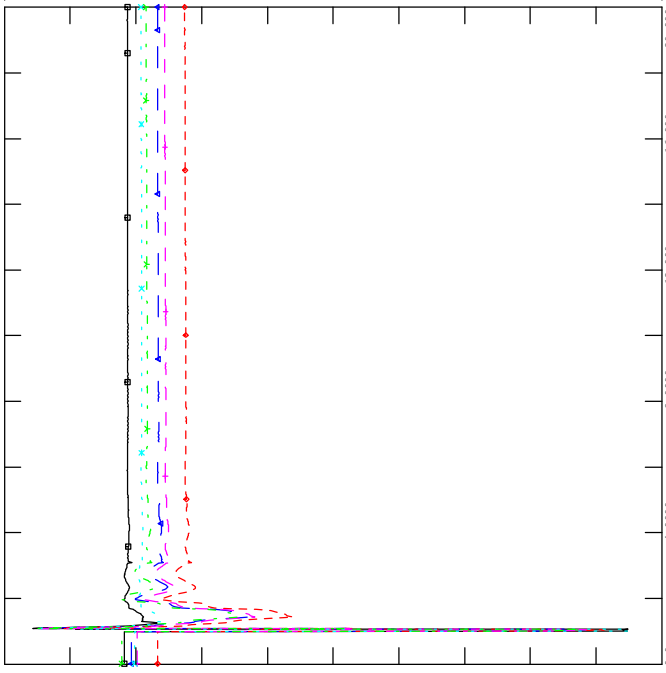
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1724 0.25980
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.2924 0.04960
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2977 0.03970
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3560 0.04530
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2445 0.13280
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1623 0.31860



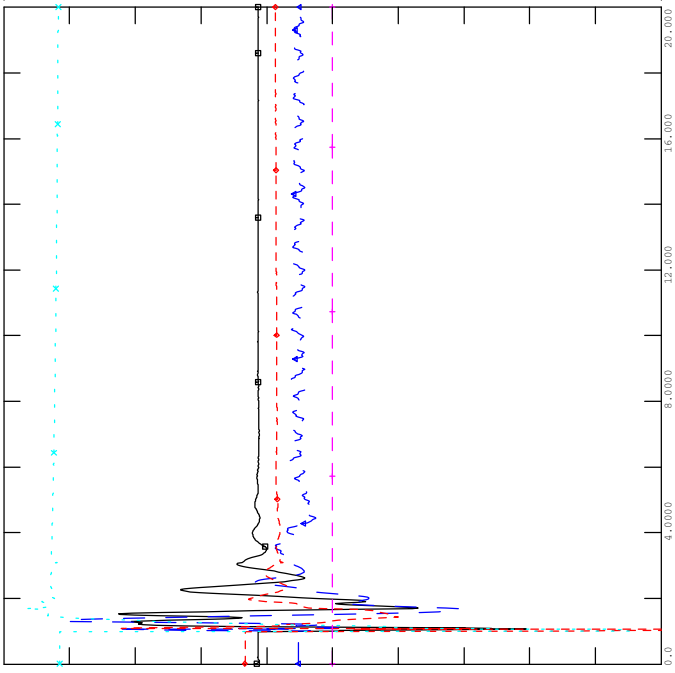
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2136 -0.1054
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.8843 0.51900
CHNL# 6: [POWR 773[SECST 20.000]1] 3.2450 2.6514
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.43130 0.08670



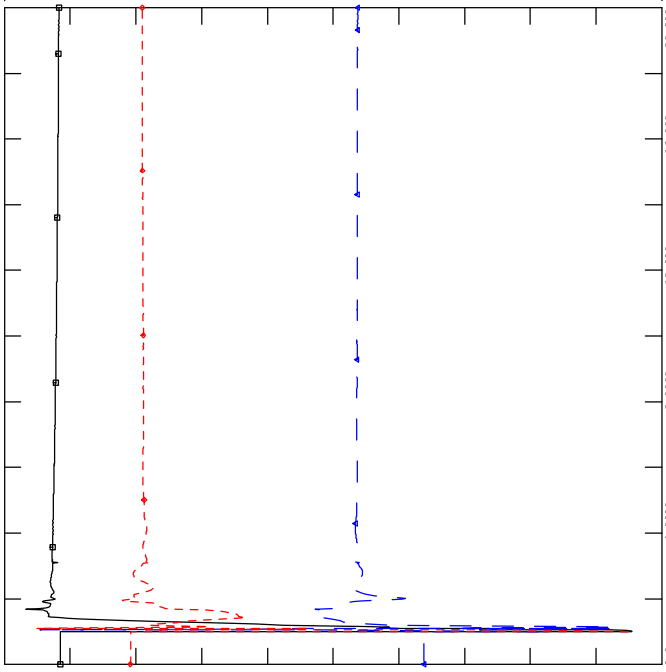
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2172 0.29320
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.7201 -0.2319
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2136 -0.1054



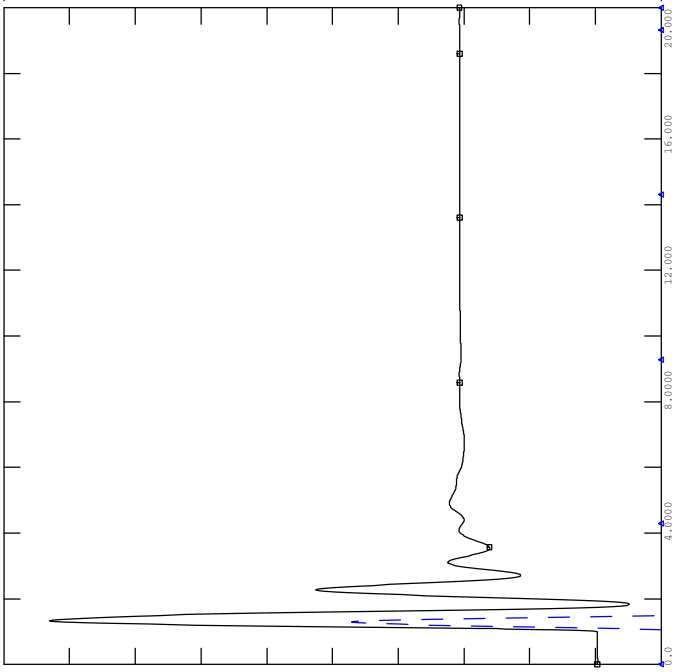
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 11.833 -8.288
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 33.458 -15.50



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
571.15 -20.23

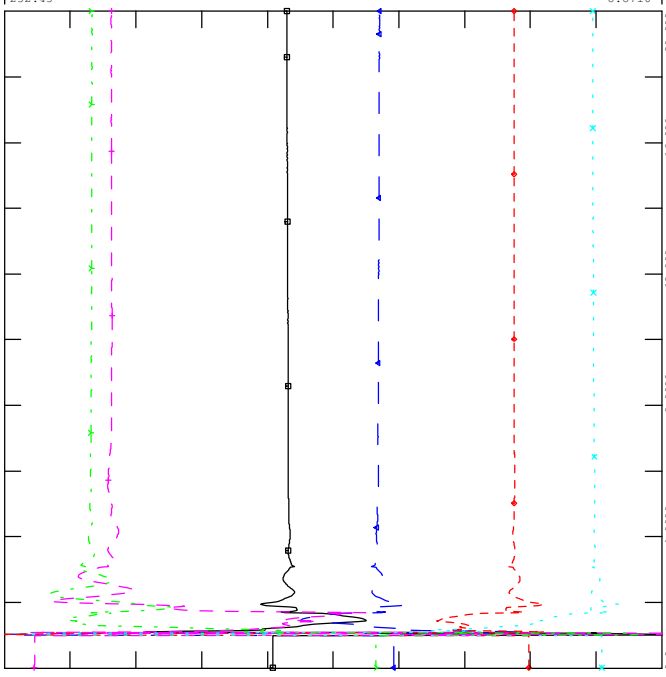
CHNL# 39: [POWR 669 TO 547004 CKT '74']
1.0307 -383.7

CHNL# 37: [POWR 662 TO 720 CKT '64']
44.990 -3.766

CHNL# 35: [POWR 669 TO 720 CKT '64']
-0.2485 -294.4

CHNL# 33: [POWR 477 TO 662 CKT '83']
-8.886 -252.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
252.43 8.8710



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

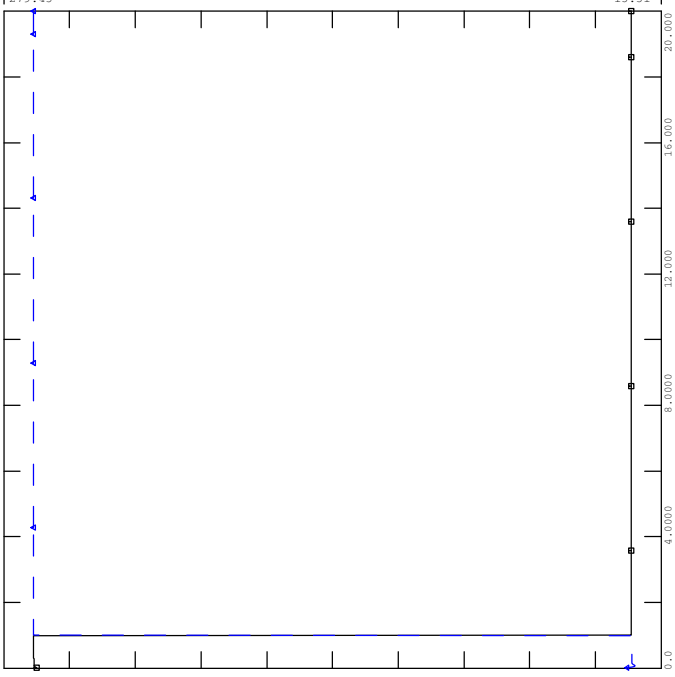
FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
0.57660 -12.11

CHNL# 43: [POWR 669 TO 1012 CKT '35']
279.45 -13.31



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

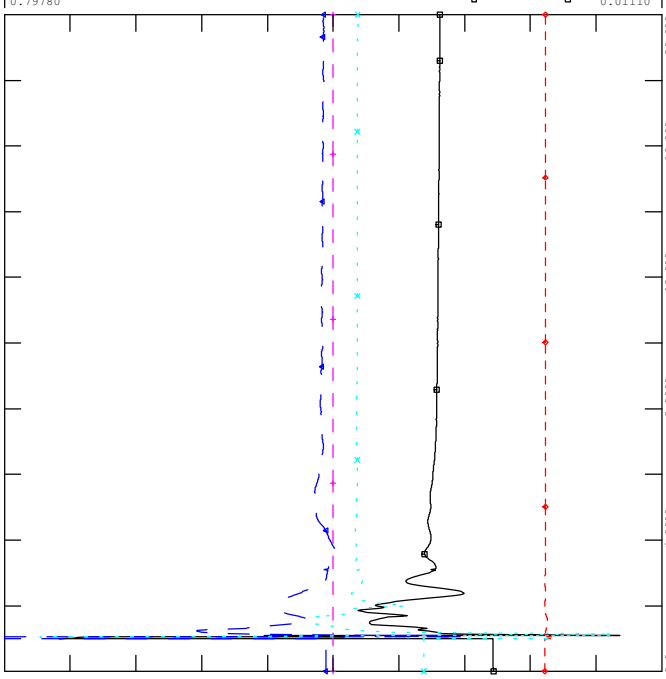
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
2.7201 -0.2319

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.6805 -0.3242

CHNL# 11: [VARS 773[SECST 20.000]1]
1.9027 -0.8504

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.79780 0.01110



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_09_1035L_NEWELL

FILE: Scn3_SP_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
116.37 -359.9

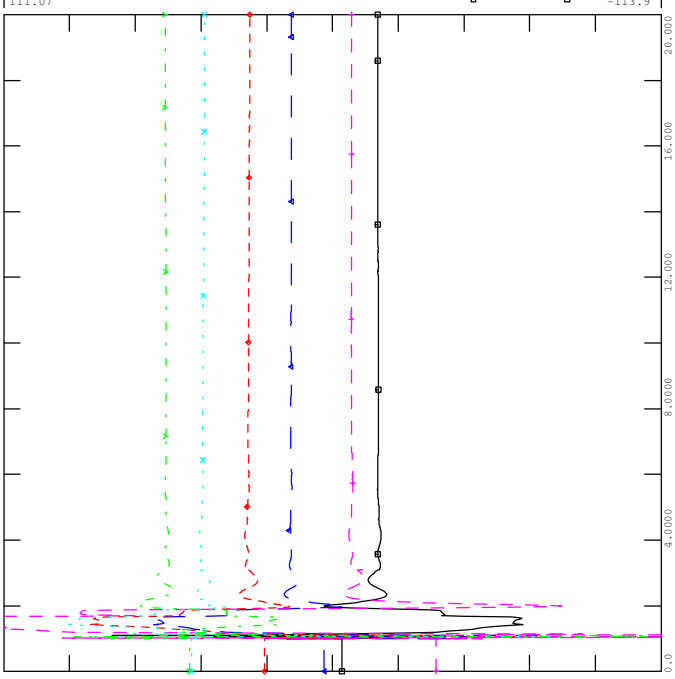
CHNL# 40: [VARS 669 TO 547004 CKT '74']
69.079 -262.3

CHNL# 38: [VARS 662 TO 720 CKT '64']
34.492 -5.604

CHNL# 36: [VARS 669 TO 720 CKT '64']
109.87 -141.2

CHNL# 34: [VARS 477 TO 662 CKT '83']
126.54 -76.10

CHNL# 32: [VARS 477 TO 547004 CKT '74']
111.07 -113.9



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1630 0.19560
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1505 0.60950
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2731 -0.0518
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3336 -0.0453
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2260 0.05860
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0999 0.70800

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2358 -0.1065
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5582 0.28900
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1929 2.7656
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.43040 0.17140

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2493 0.01960
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7019 -0.1284
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2358 -0.1065

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.0368 -2.683
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 5.9429 -11.58

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
533.10 -27.20

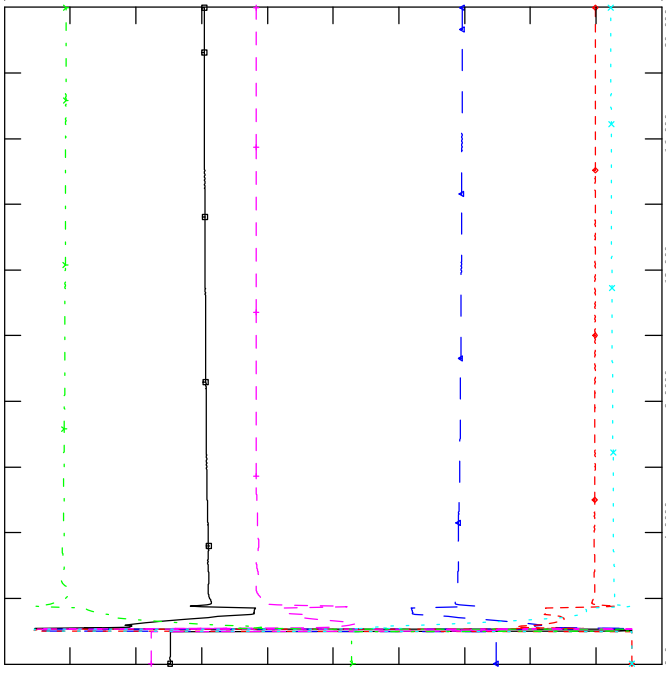
CHNL# 39: [POWR 669 TO 547004 CKT '74']
18.122 -366.3

CHNL# 37: [POWR 662 TO 720 CKT '64']
60.800 -20.14

CHNL# 35: [POWR 669 TO 720 CKT '64']
13.046 -246.6

CHNL# 33: [POWR 477 TO 662 CKT '83']
16.180 -210.0

CHNL# 31: [POWR 477 TO 547004 CKT '74']
209.98 -16.06



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

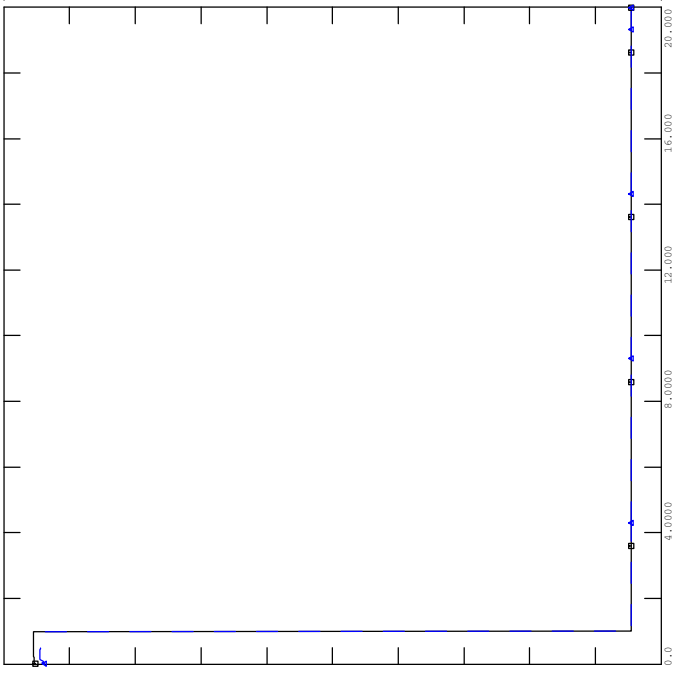
FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
656.71 -31.27

CHNL# 43: [POWR 669 TO 1012 CKT '35']
27665. -1317.



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

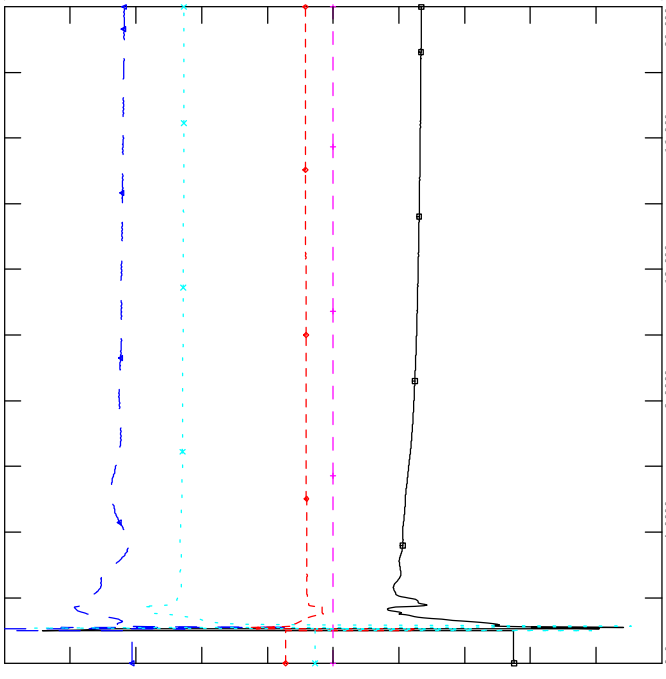
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.7019 -0.1284

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.09080 -0.0435

CHNL# 11: [VARS 773[SECST 20.000]1]
0.81500 -0.5139

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.88280 0.01810



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_10_1035L_BOWMANTON

FILE: Scn3_SP_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
246.71 -109.4

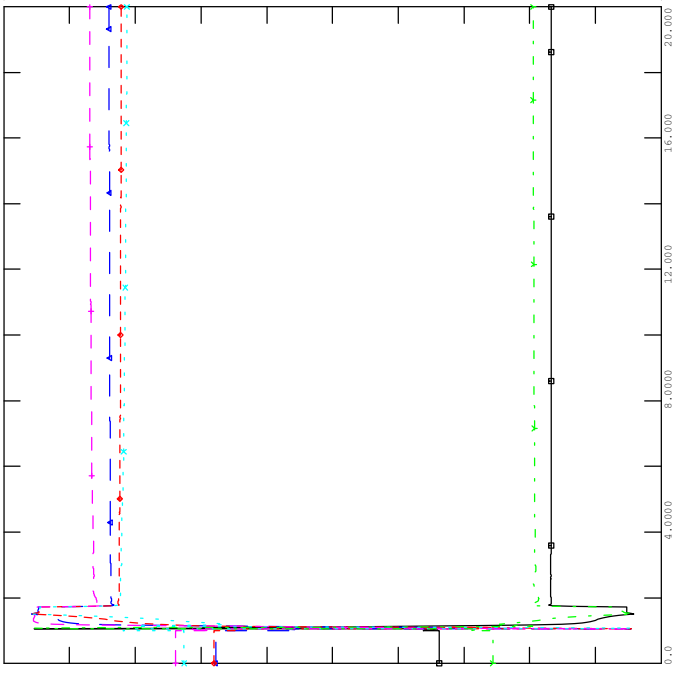
CHNL# 40: [VARS 669 TO 547004 CKT '74']
50.342 -226.7

CHNL# 38: [VARS 662 TO 720 CKT '64']
56.617 -128.7

CHNL# 36: [VARS 669 TO 720 CKT '64']
95.778 -171.5

CHNL# 34: [VARS 477 TO 662 CKT '83']
98.984 -122.0

CHNL# 32: [VARS 477 TO 547004 CKT '74']
151.58 -84.22



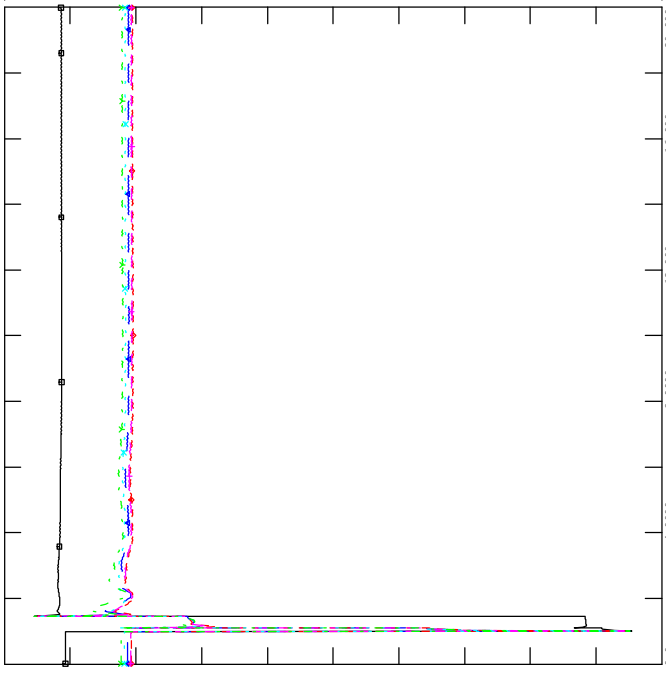
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0274 0.92460
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0727 0.92670
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0713 0.92520
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0811 0.92310
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0535 0.92640
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0636 0.47260



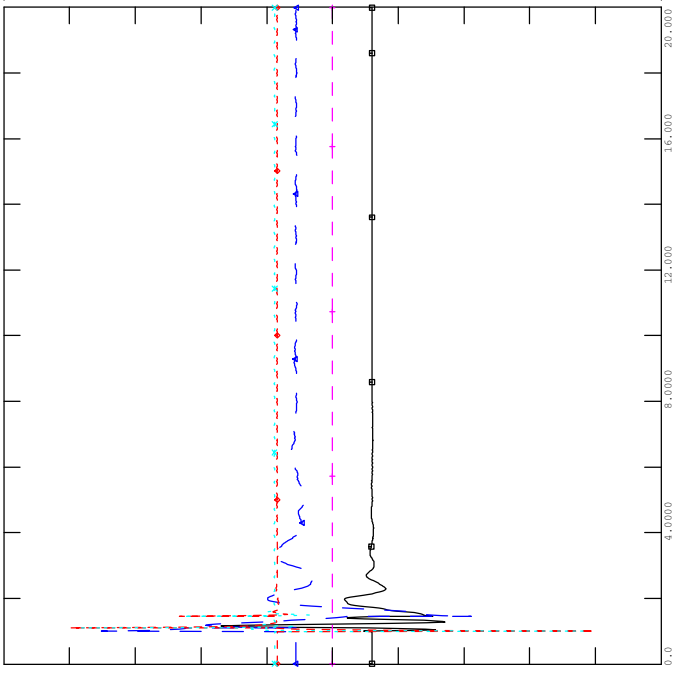
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1979 1.7563
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2246 1.7228
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1018 2.8255
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.38290 0.23130



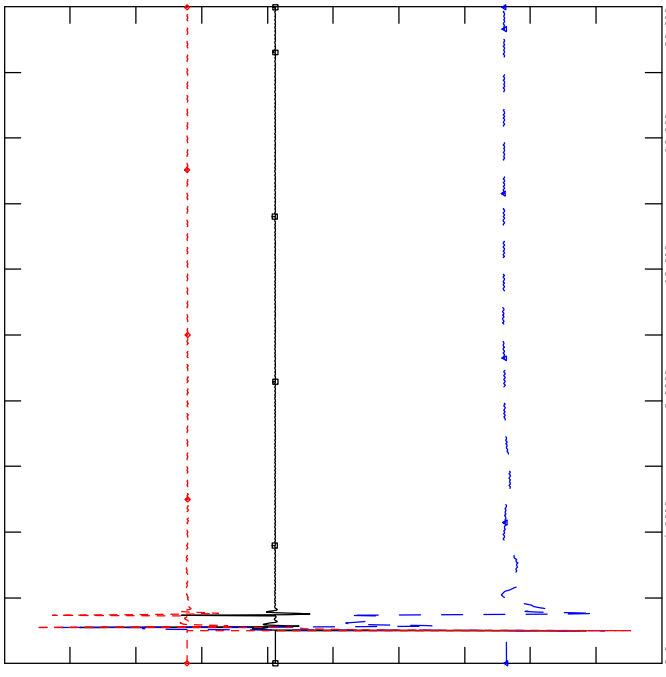
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0845 0.92450
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2780 0.69980
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1979 1.7563



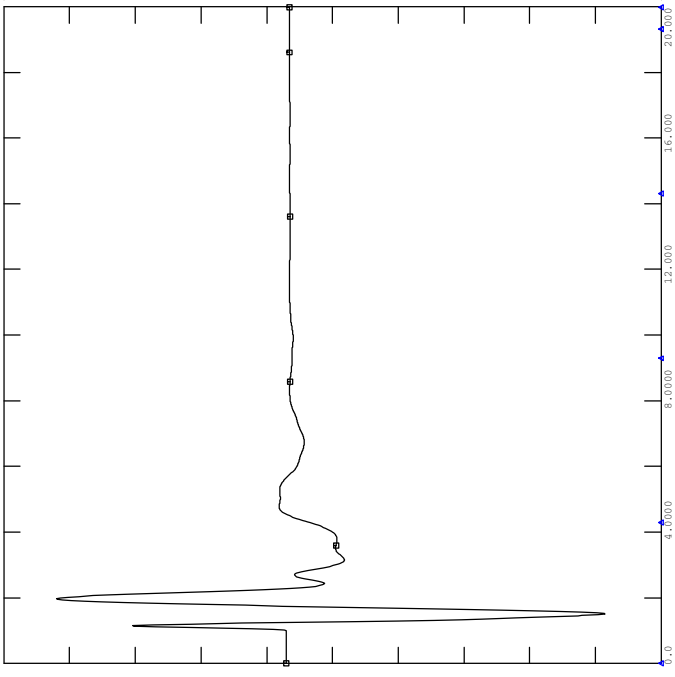
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.5055 -2.076
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -7.904 -14.49



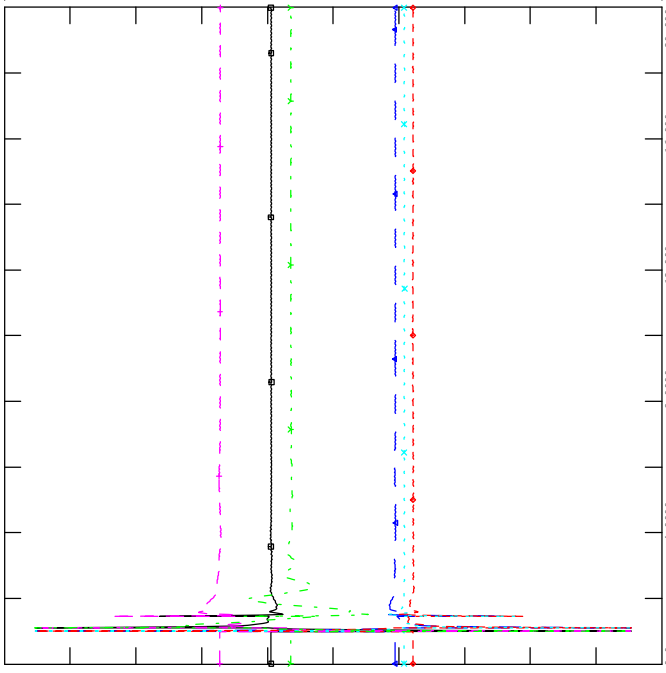
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 258.74 209.14
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -305.5 -376.4
CHNL# 37: [POWR 662 TO 720 CKT '64'] 45.553 37.029
CHNL# 35: [POWR 669 TO 720 CKT '64'] -204.3 -253.4
CHNL# 33: [POWR 477 TO 662 CKT '83'] -132.5 -167.0
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 167.04 132.51



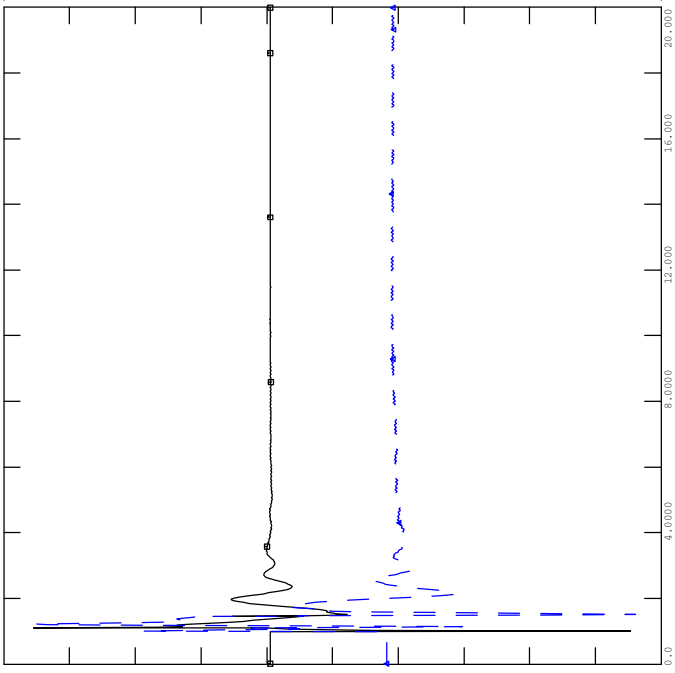
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] -7.576 -14.81
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 285.50 231.18



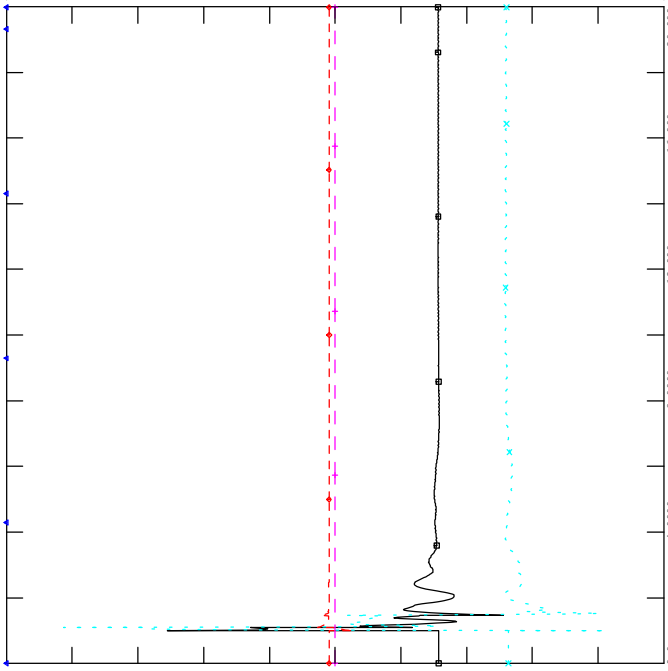
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2780 0.69980
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.08530 -0.0206
CHNL# 11: [VARS 773[SECST 20.000]1] 0.17980 -0.2185
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.34840 0.14250



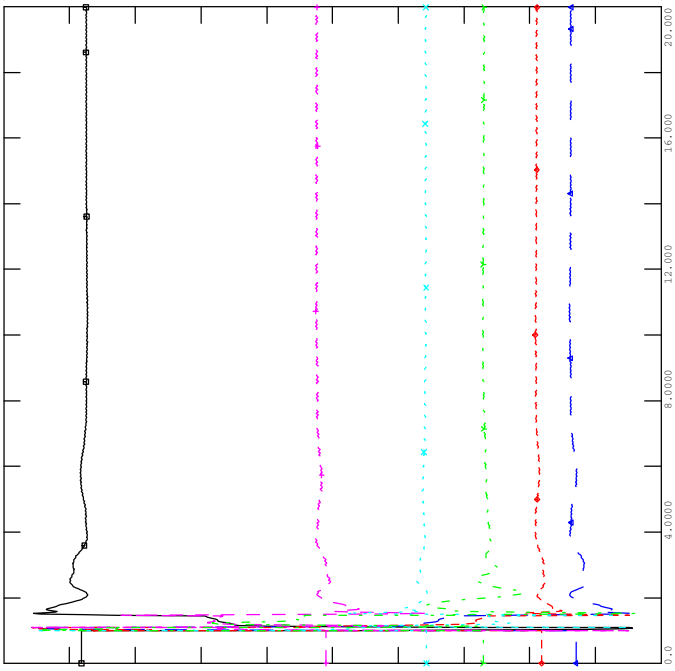
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_11_892L_SUFFIELD

FILE: Scn3_SP_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] -9.471 -21.51
CHNL# 40: [VARS 669 TO 547004 CKT '74'] -1.349 -39.10
CHNL# 38: [VARS 662 TO 720 CKT '64'] 12.020 4.1134
CHNL# 36: [VARS 669 TO 720 CKT '64'] 26.922 6.7041
CHNL# 34: [VARS 477 TO 662 CKT '83'] 46.904 24.941
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -1.735 -26.68



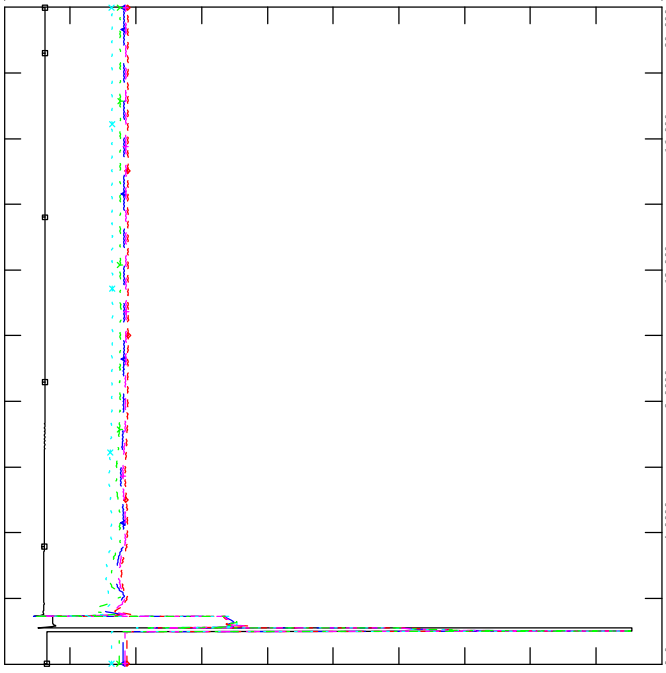
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0279 0.92050
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0703 0.92130
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0711 0.91930
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0812 0.91680
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0536 0.92130
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0813 -0.0403



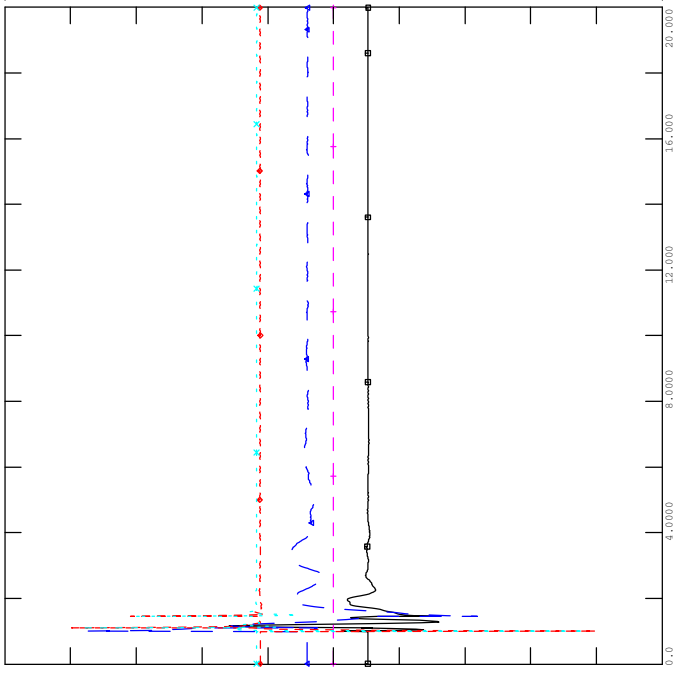
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1838 1.7457
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2099 1.7105
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1231 2.8100
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.37910 0.23230



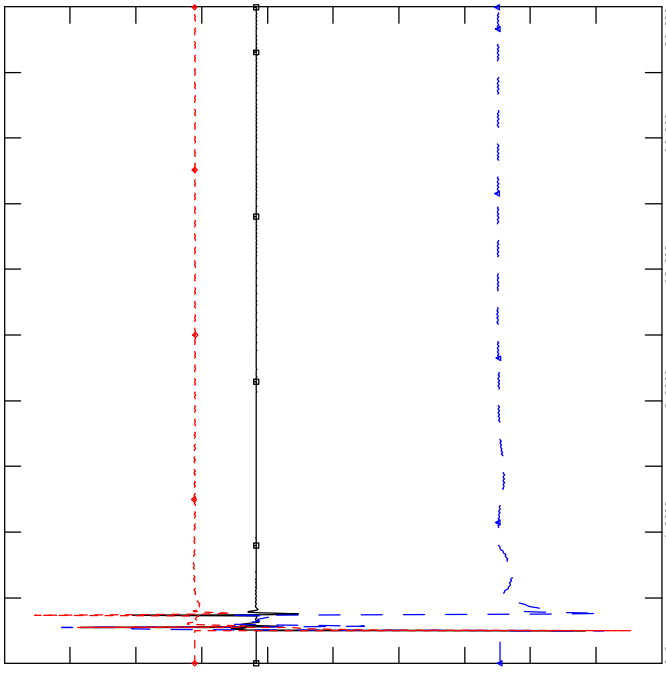
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0895 0.91860
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2691 0.69540
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1838 1.7457



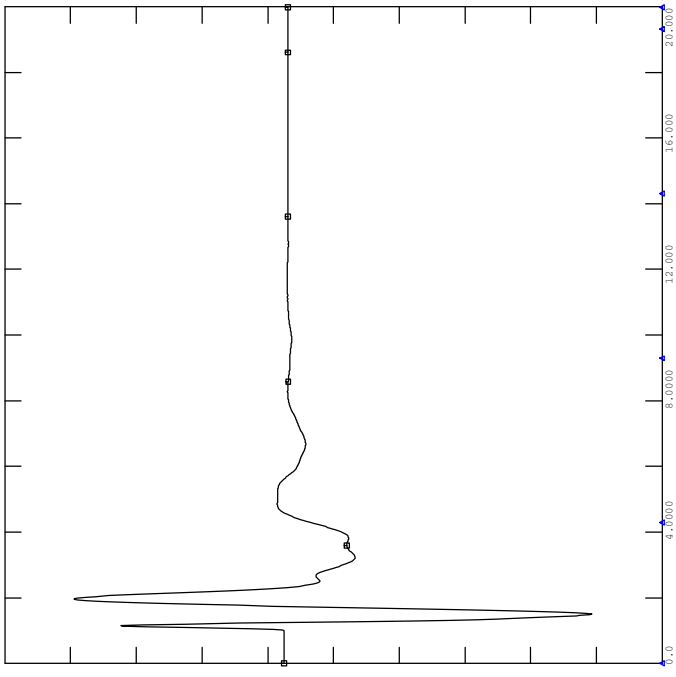
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2145 -2.033
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -8.497 -13.76



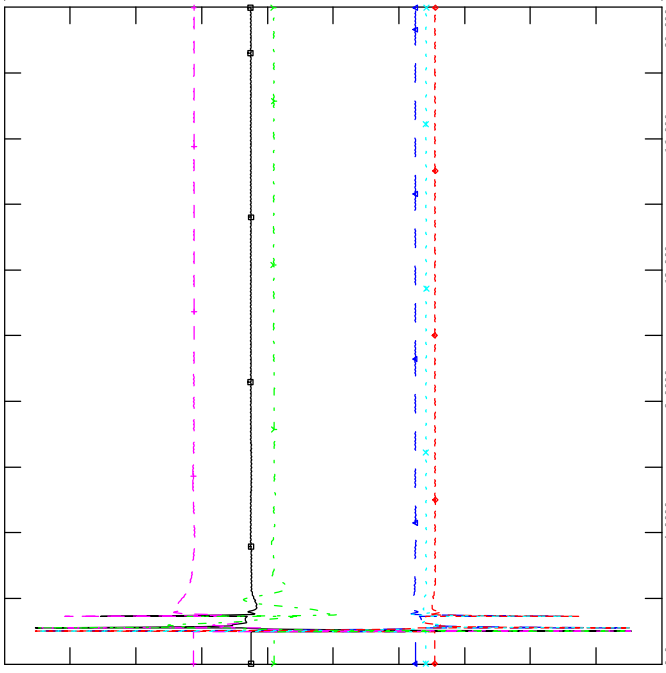
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 256.77 208.84
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -303.6 -373.9
CHNL# 37: [POWR 662 TO 720 CKT '64'] 45.186 36.762
CHNL# 35: [POWR 669 TO 720 CKT '64'] -202.9 -251.6
CHNL# 33: [POWR 477 TO 662 CKT '83'] -131.6 -165.9
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 165.91 131.55



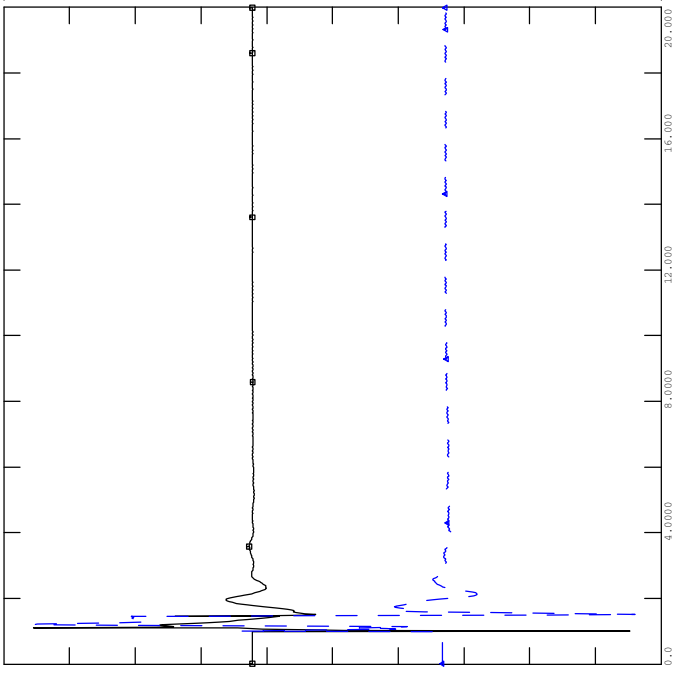
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] -5.266 -15.05
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 283.47 230.61



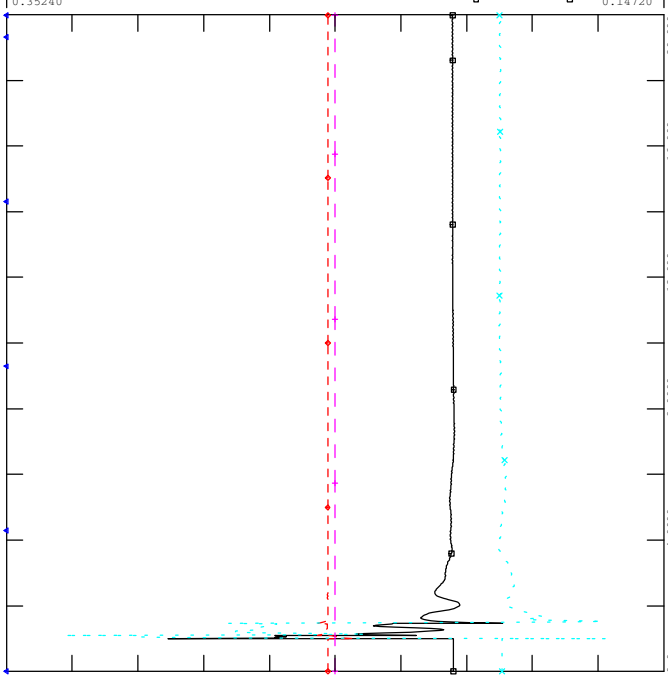
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1] 1.2691 0.69540
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.08510 -0.0208
CHNL# 11: [VARS 773[SECST 20.000]1] 0.21180 -0.2396
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.35240 0.14720



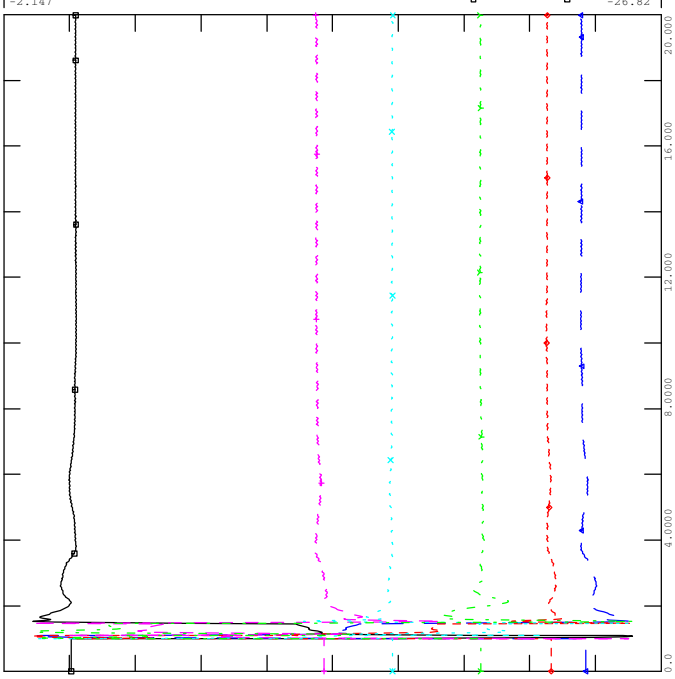
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_12_892L_BOWMANTON

FILE: Scn3_SP_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] -9.409 -21.60
CHNL# 40: [VARS 669 TO 547004 CKT '74'] -0.0046 -43.32
CHNL# 38: [VARS 662 TO 720 CKT '64'] 12.153 3.9252
CHNL# 36: [VARS 669 TO 720 CKT '64'] 27.073 7.0356
CHNL# 34: [VARS 477 TO 662 CKT '83'] 47.057 25.297
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -2.147 -26.82



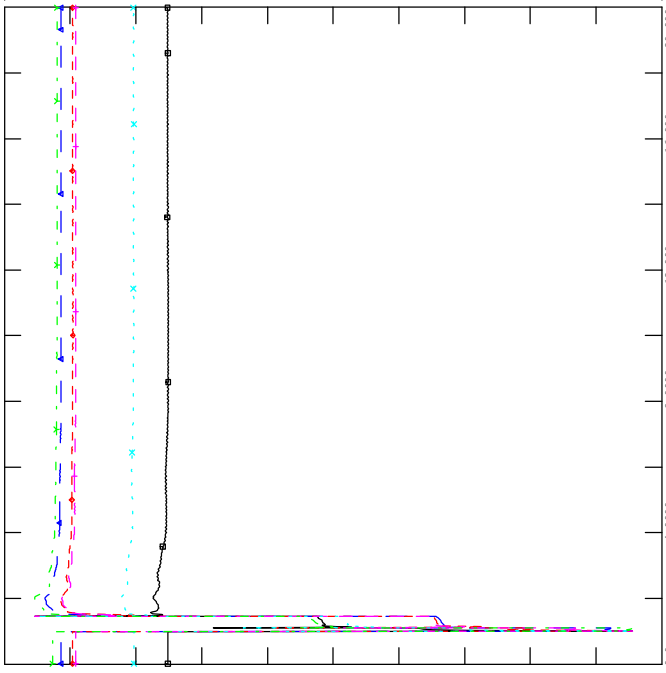
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0742 0.18820
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0917 0.86030
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1057 0.52890
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1164 0.48160
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0955 0.33070
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0509 0.88140



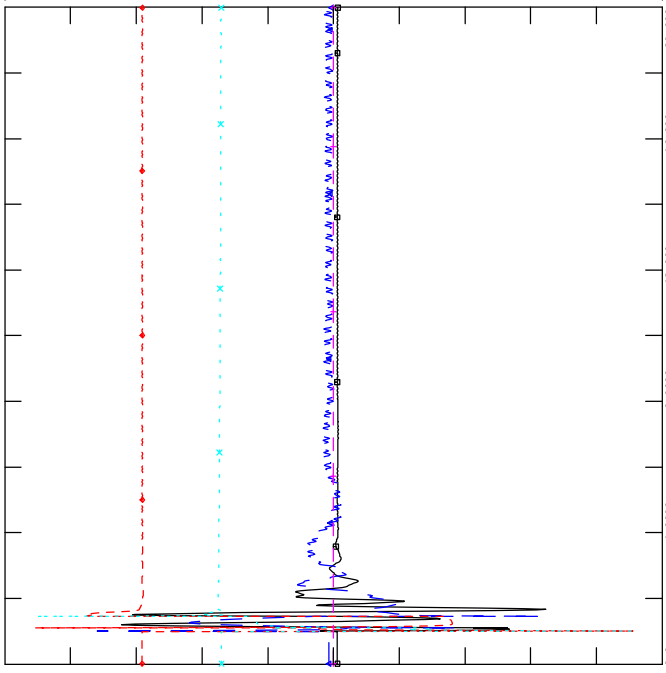
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8234 0.37540
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3353 0.80800
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0935 2.8612
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.44020 0.15910



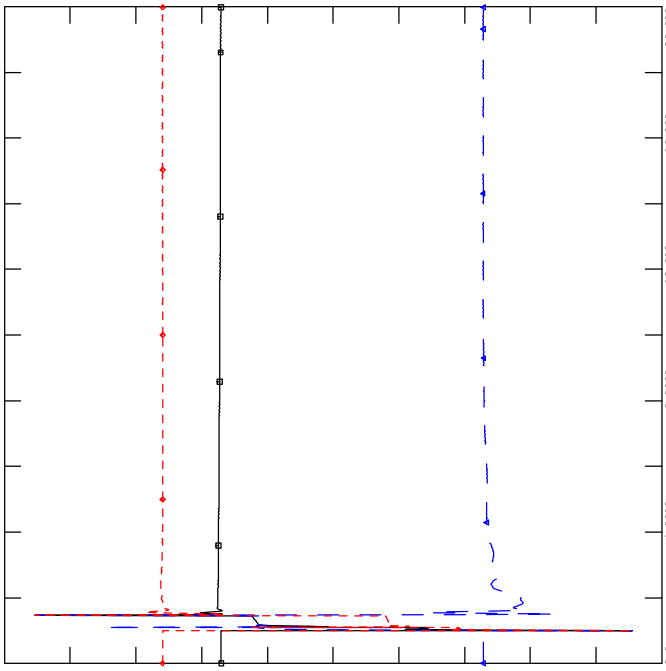
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1964 0.54550
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0437 0.38710
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8234 0.37540



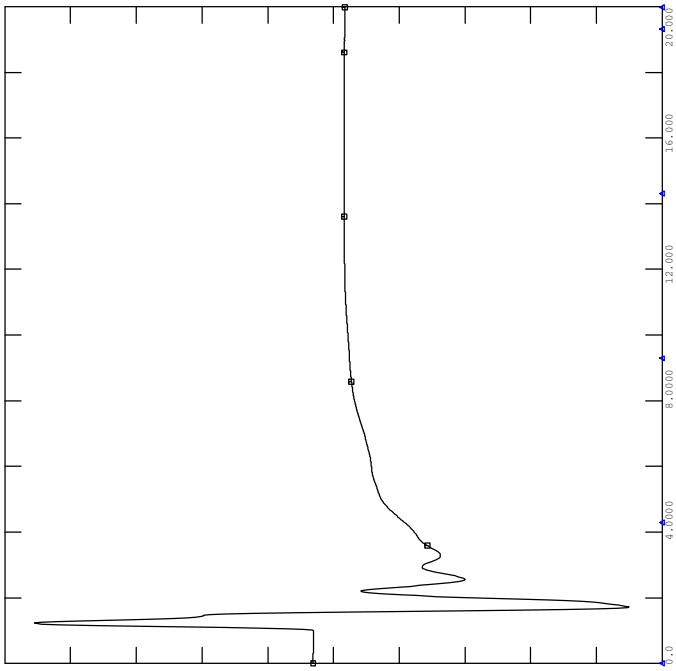
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.3244 -1.457
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 1.9945 -25.15



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
315.68 65.006

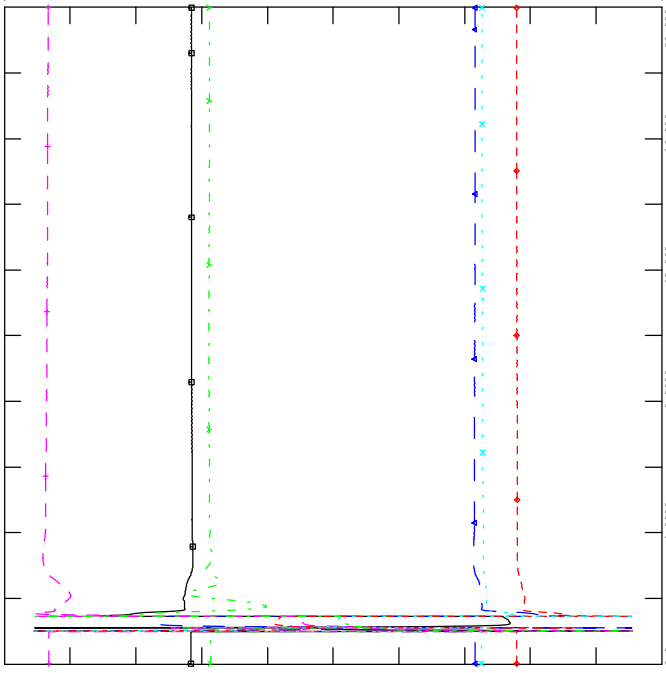
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-107.4 -439.7

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.434 5.6806

CHNL# 35: [POWR 669 TO 720 CKT '64']
-85.67 -277.1

CHNL# 33: [POWR 477 TO 662 CKT '83']
-68.95 -186.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
186.35 68.952



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

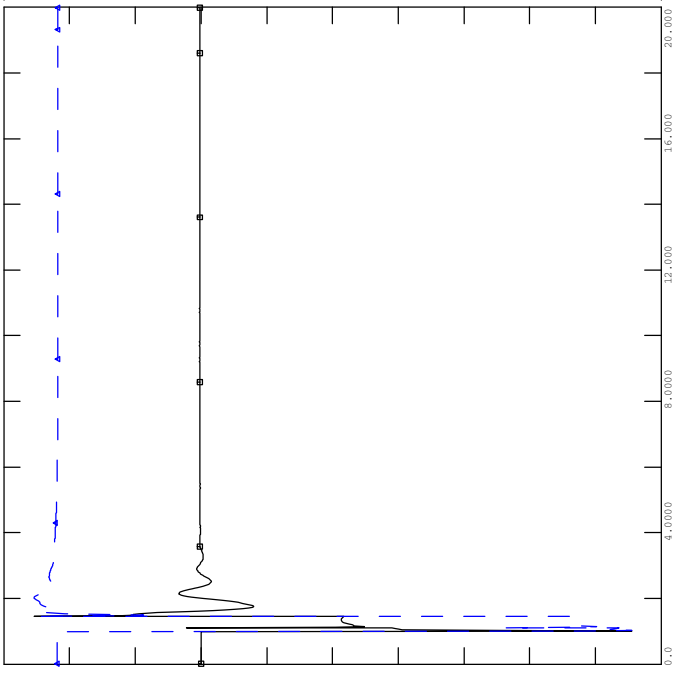
FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
8.1221 -237.4

CHNL# 43: [POWR 669 TO 1012 CKT '35']
343.11 77.568



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

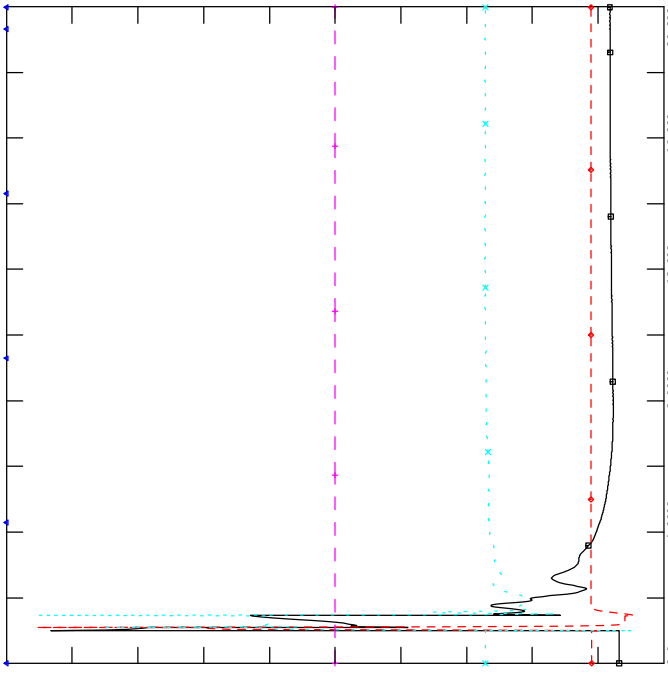
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.0437 0.38710

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.0869 -0.0972

CHNL# 11: [VARS 773[SECST 20.000]1]
0.27140 -0.2211

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.90150 0.16300



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_13_676L_BULLSHEAD

FILE: Scn3_SP_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
1.1859 -238.6

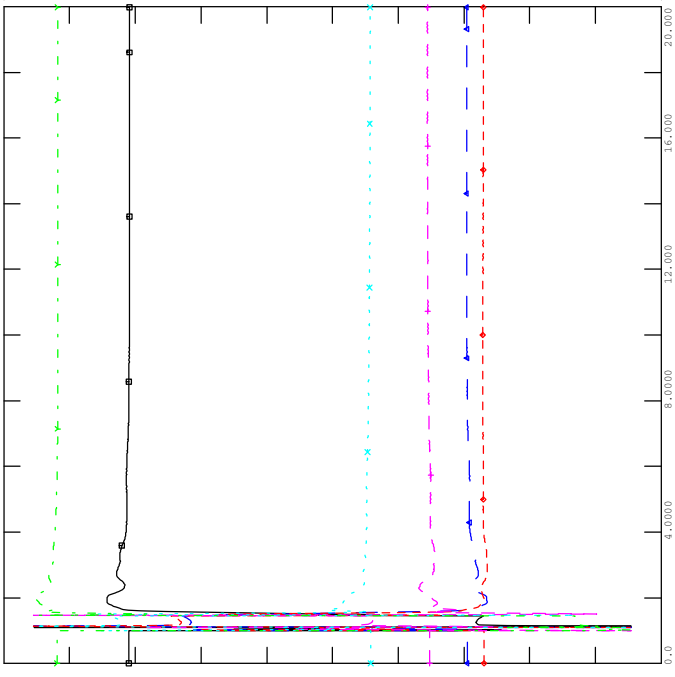
CHNL# 40: [VARS 669 TO 547004 CKT '74']
45.161 -81.61

CHNL# 38: [VARS 662 TO 720 CKT '64']
28.206 -2.777

CHNL# 36: [VARS 669 TO 720 CKT '64']
85.322 -17.27

CHNL# 34: [VARS 477 TO 662 CKT '83']
87.817 2.6437

CHNL# 32: [VARS 477 TO 547004 CKT '74']
12.556 -78.01



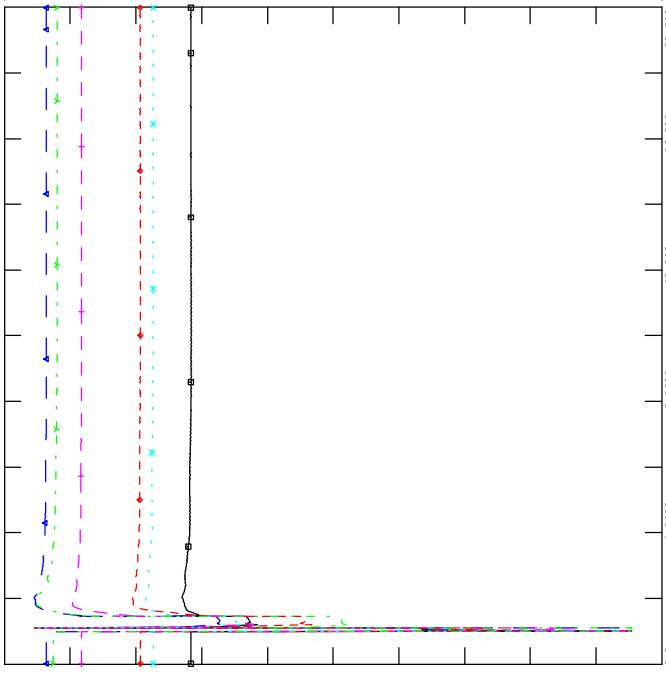
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0814 0.10760
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1361 0.73830
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1492 0.24490
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2886 0.13510
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1024 -0.0400
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0929 0.79640



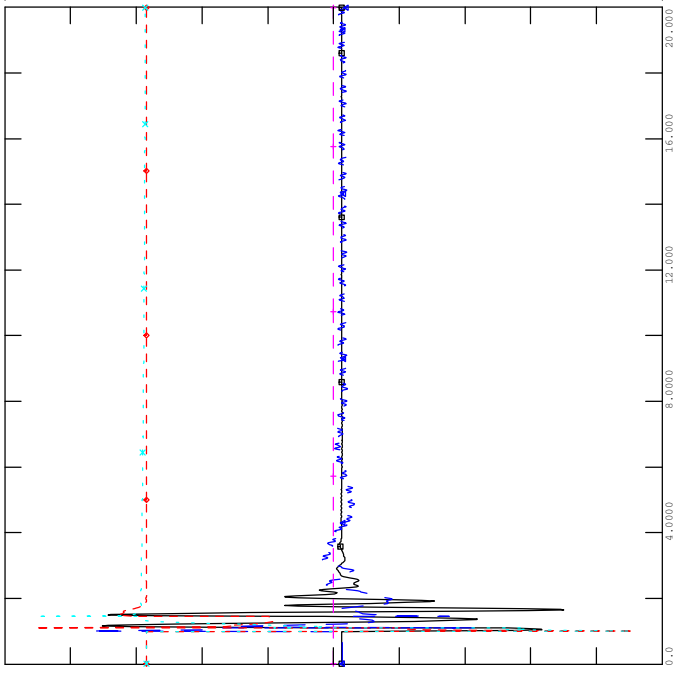
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6025 -0.1239
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5542 0.05240
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1121 2.8529
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.46990 0.13430



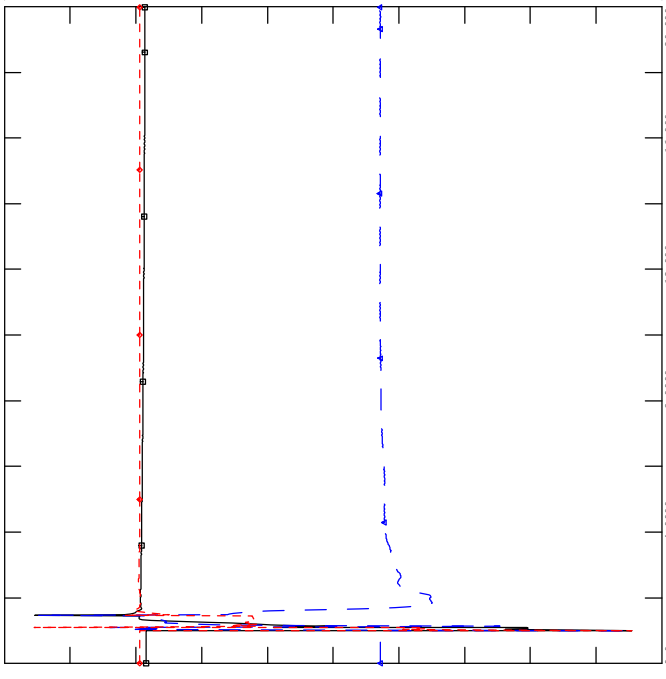
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2387 0.27240
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.6932 0.19500
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6025 -0.1239



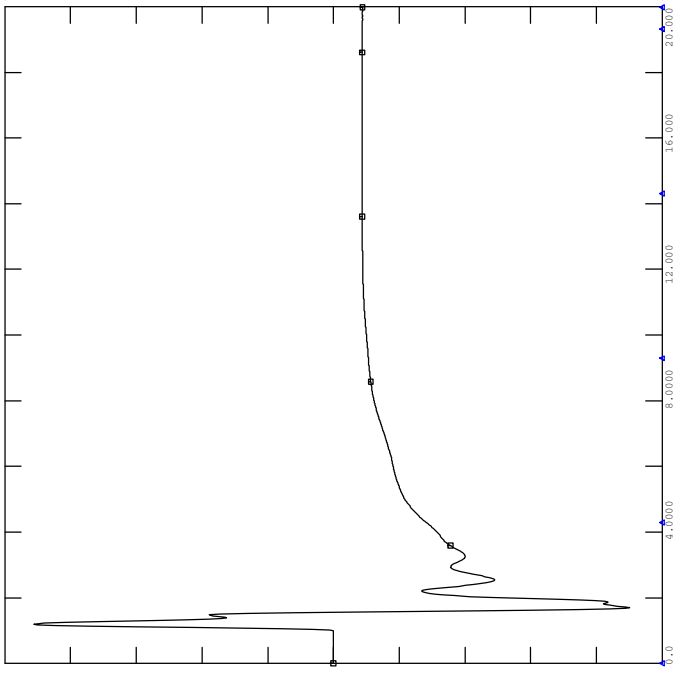
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 1.7732 -0.7501
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 3.7335 -25.23



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
302.76 -16.24

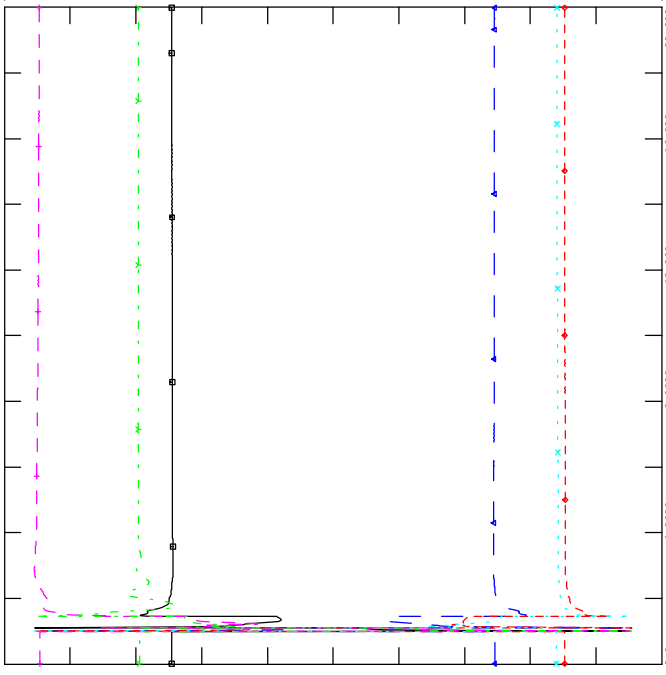
CHNL# 39: [POWR 669 TO 547004 CKT '74']
14.333 -418.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
46.008 -14.04

CHNL# 35: [POWR 669 TO 720 CKT '64']
10.616 -277.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
10.072 -208.7

CHNL# 31: [POWR 477 TO 547004 CKT '74']
208.65 -10.07



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

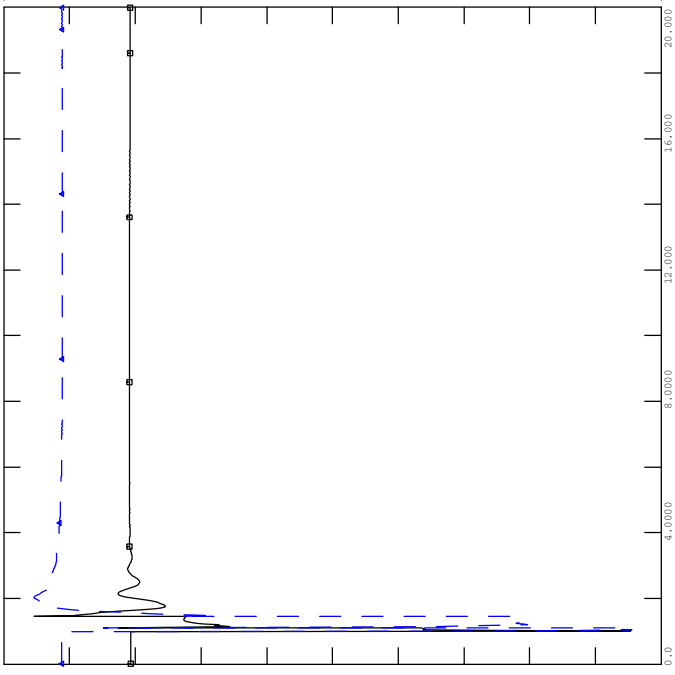
FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
8.5705 -222.8

CHNL# 43: [POWR 669 TO 1012 CKT '35']
329.18 -10.46



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

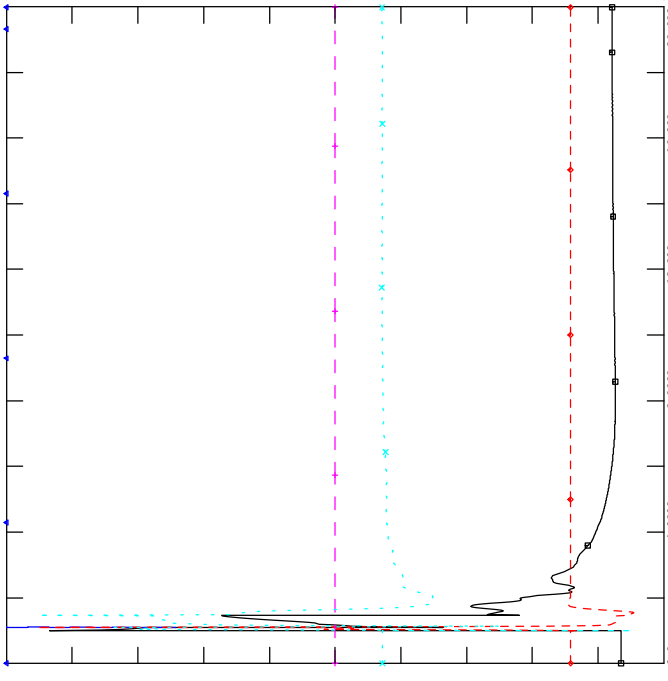
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.6932 0.19500

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.1427 -0.3147

CHNL# 11: [VARS 773[SECST 20.000]1]
0.51760 -0.4746

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.93170 0.16300



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_14_676L_BOWMANTON

FILE: Scn3_SP_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
1.5898 -223.9

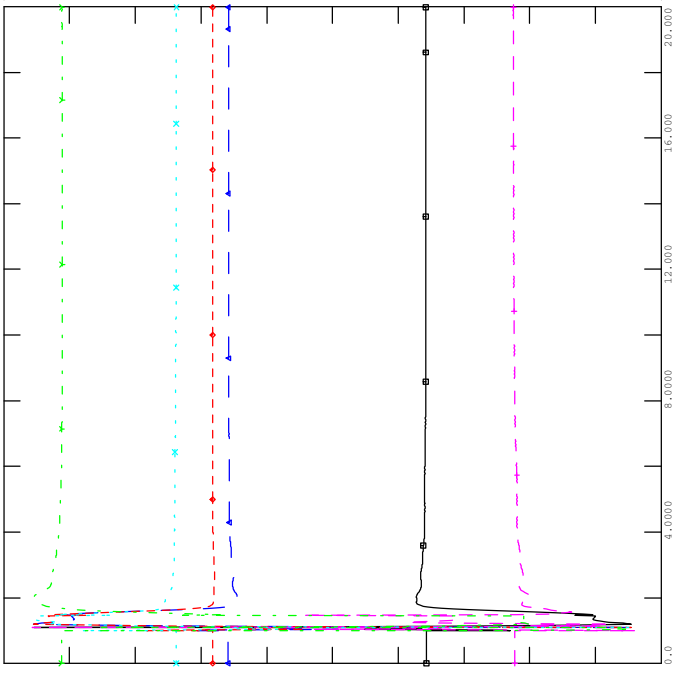
CHNL# 40: [VARS 669 TO 547004 CKT '74']
65.346 -281.1

CHNL# 38: [VARS 662 TO 720 CKT '64']
34.731 0.53140

CHNL# 36: [VARS 669 TO 720 CKT '64']
110.38 -204.3

CHNL# 34: [VARS 477 TO 662 CKT '83']
120.17 -150.6

CHNL# 32: [VARS 477 TO 547004 CKT '74']
180.35 -107.7



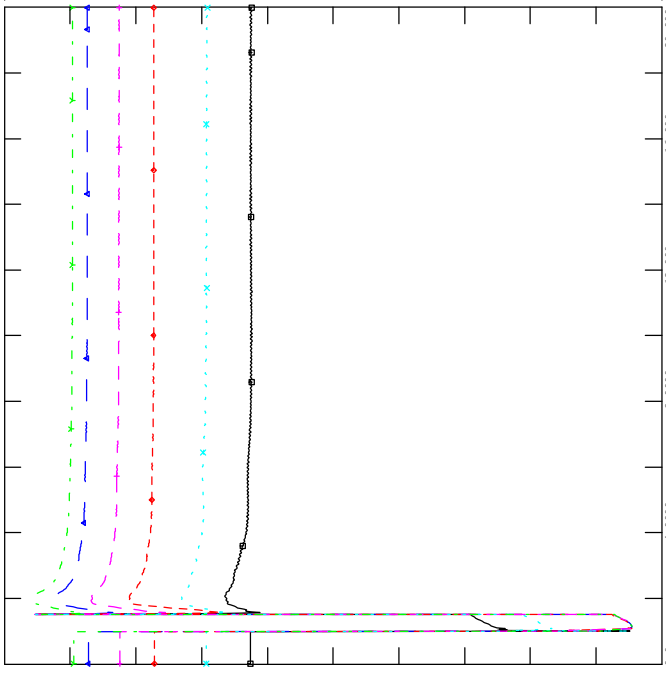
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0734 0.46230
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0928 0.94060
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1160 0.70060
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1616 0.67520
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0976 0.56490
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0521 0.93620



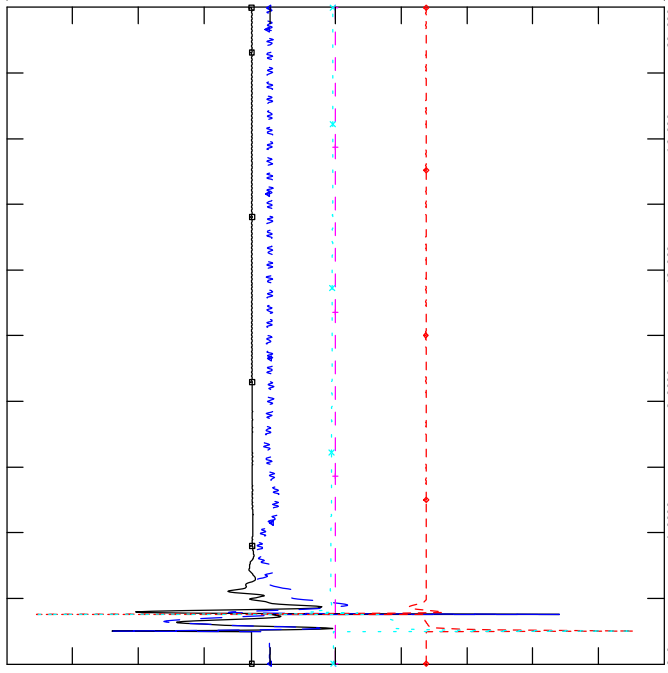
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8480 1.1734
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.3765 1.2425
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0857 2.8189
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.41460 0.10170



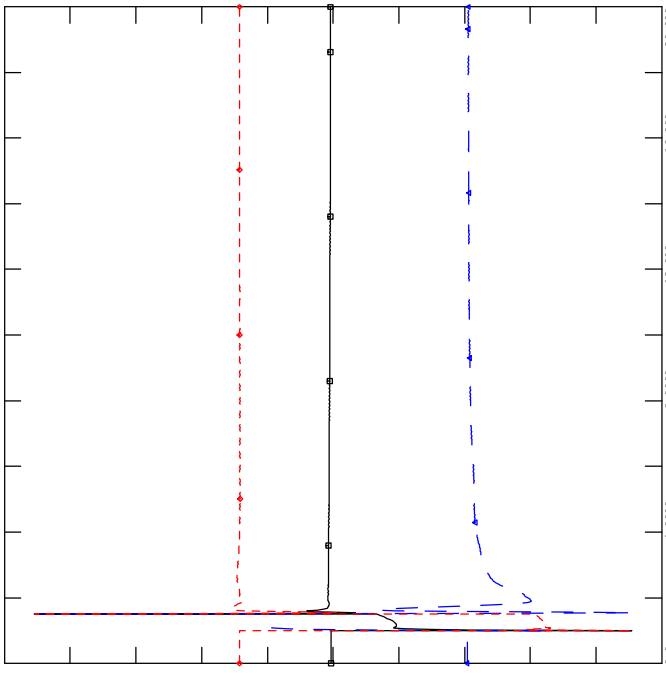
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2160 0.72360
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0963 0.30610
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8480 1.1734



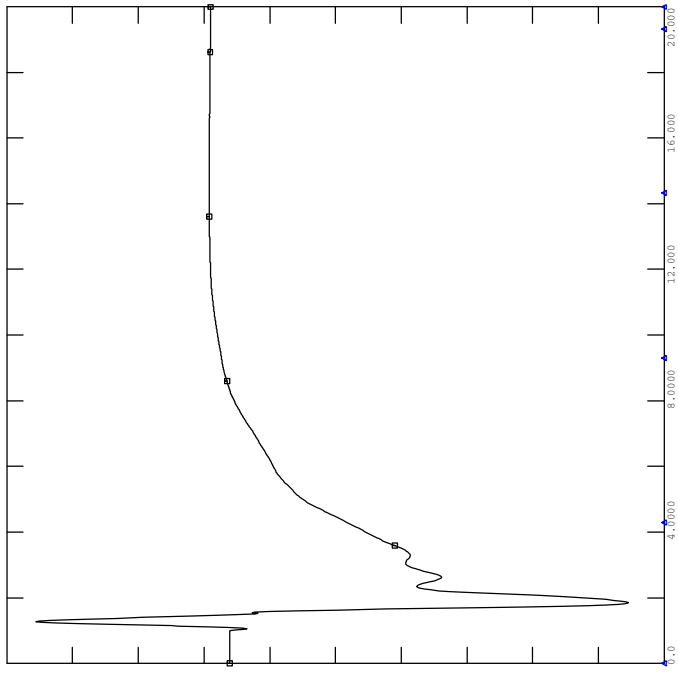
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.4853 -1.431
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -5.247 -21.45

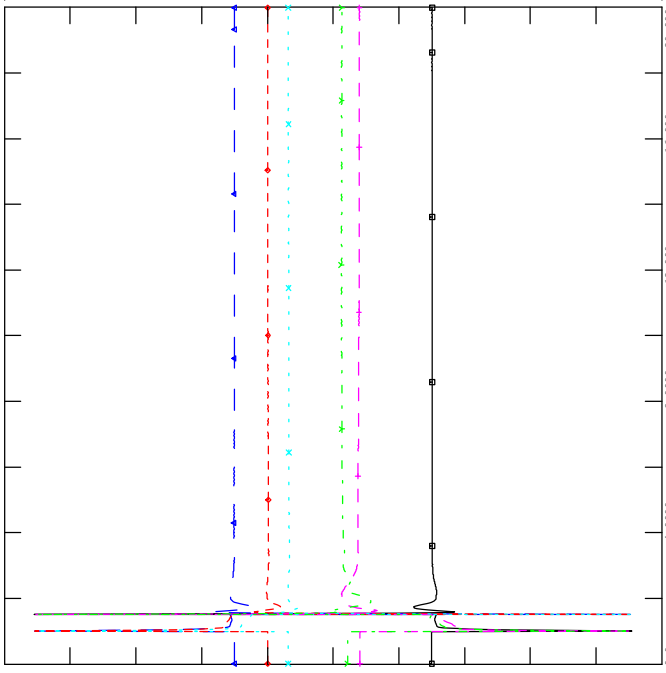


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 374.53 111.42
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -209.9 -531.4
CHNL# 37: [POWR 662 TO 720 CKT '64'] 66.542 22.570
CHNL# 35: [POWR 669 TO 720 CKT '64'] -142.8 -372.5
CHNL# 33: [POWR 477 TO 662 CKT '83'] -96.19 -258.6
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 258.61 96.189

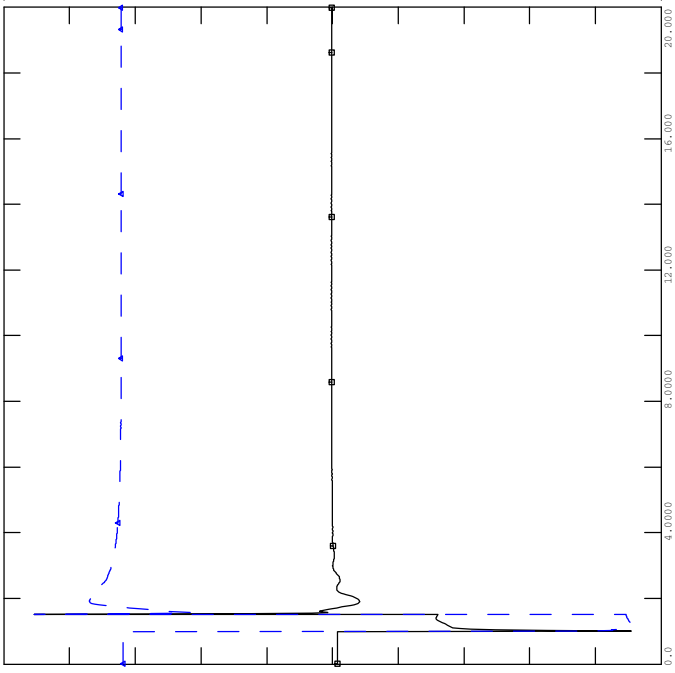


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 33.222 -214.4
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 402.05 128.99

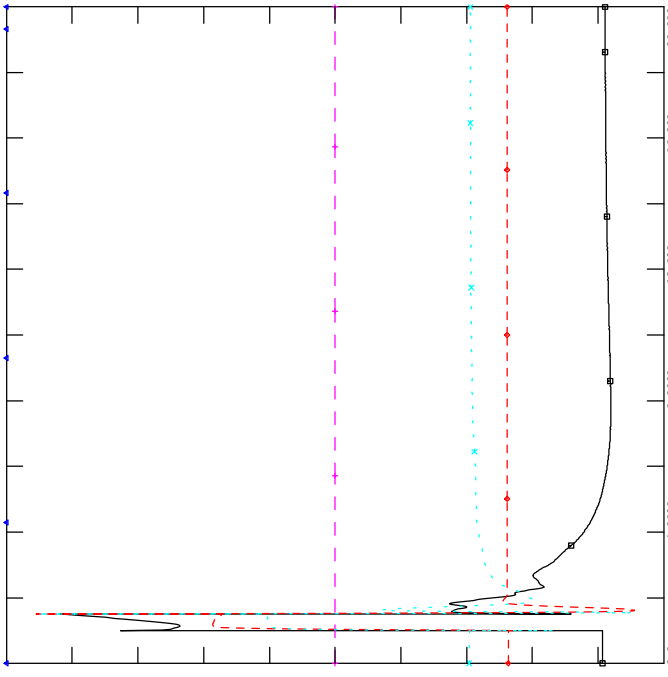


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14 REACTIVE POWER

CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1] 2.0963 0.30610
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 1.0709 -0.2888
CHNL# 11: [VARS 773[SECST 20.000]1] 0.12340 -0.2250
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.77490 0.15520

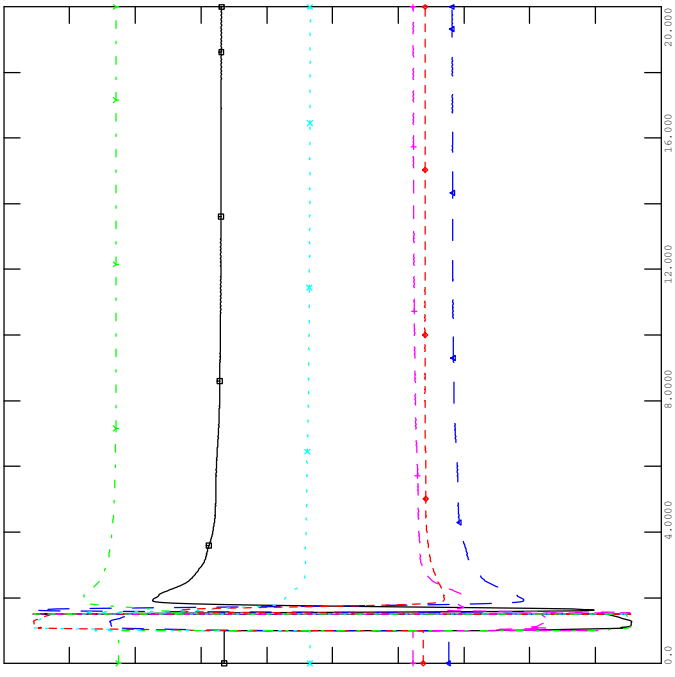


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_15_600L_PEACEBUTTE

FILE: Scn3_SP_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 23.703 -217.1
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 43.588 -105.0
CHNL# 38: [VARS 662 TO 720 CKT '64'] 25.725 -2.542
CHNL# 36: [VARS 669 TO 720 CKT '64'] 72.120 -24.58
CHNL# 34: [VARS 477 TO 662 CKT '83'] 69.769 7.7352
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 19.285 -52.13



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

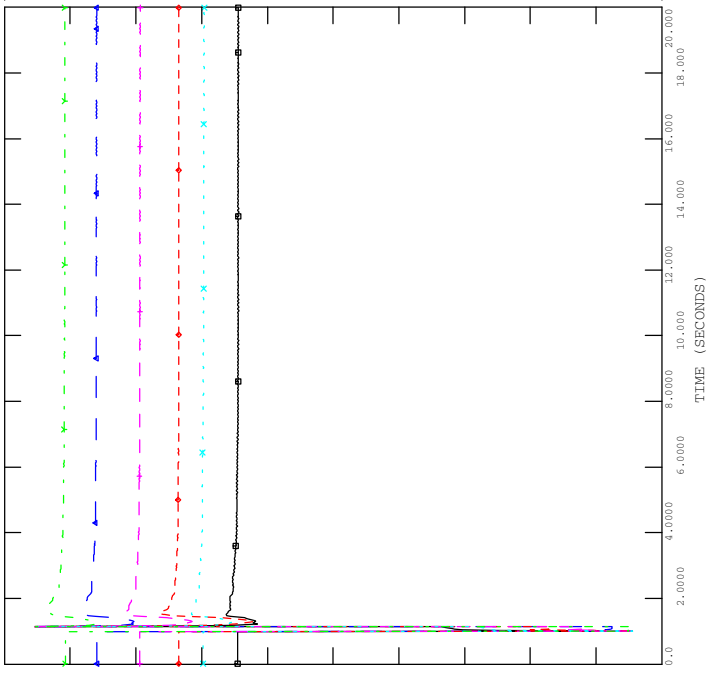
FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0927 0.18720
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1268 0.85950
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1770 0.52780
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2570 0.47760
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1438 0.33140
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0791 0.88070

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

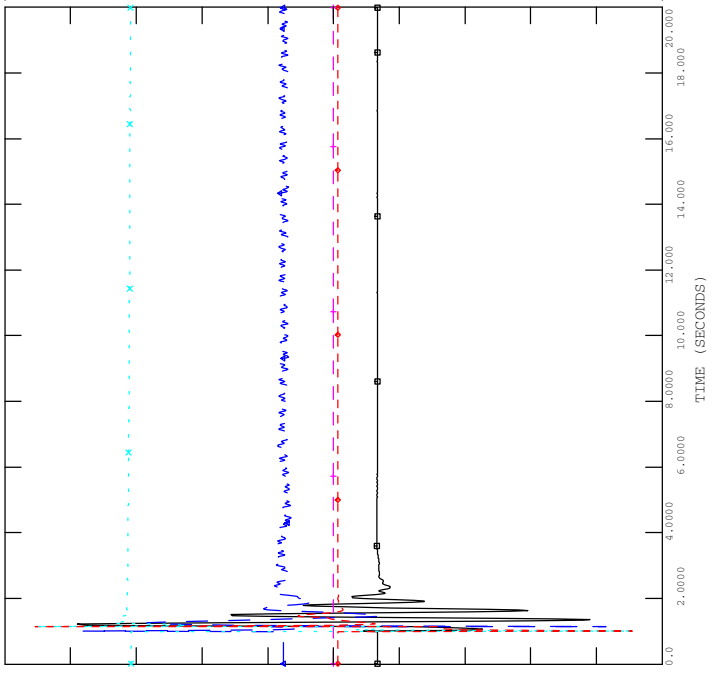
FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3989 0.40350
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.2975 0.76860
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0949 2.8216
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.55350 0.10260

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

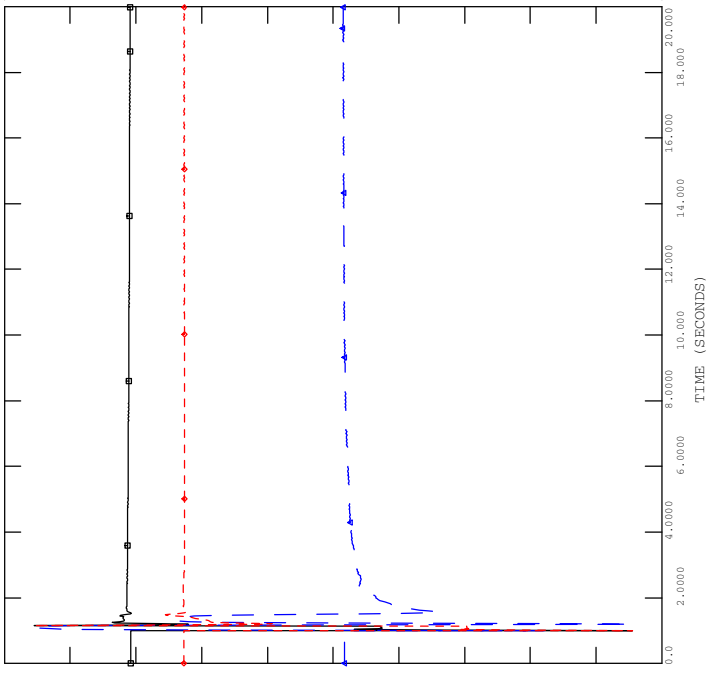
FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2257 0.54620
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.4665 0.24860
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3989 0.40350

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

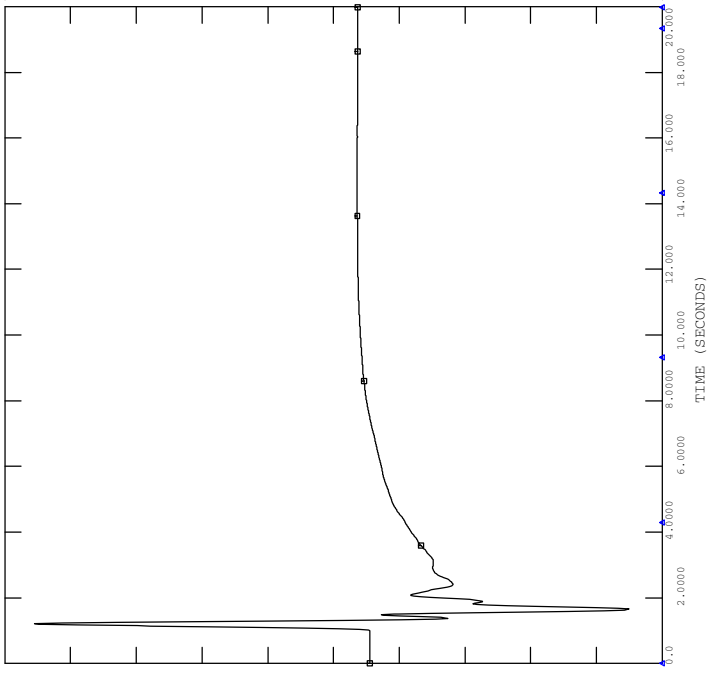
FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.1088 -0.8844
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 2.2021 -21.09

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
367.30 62.660

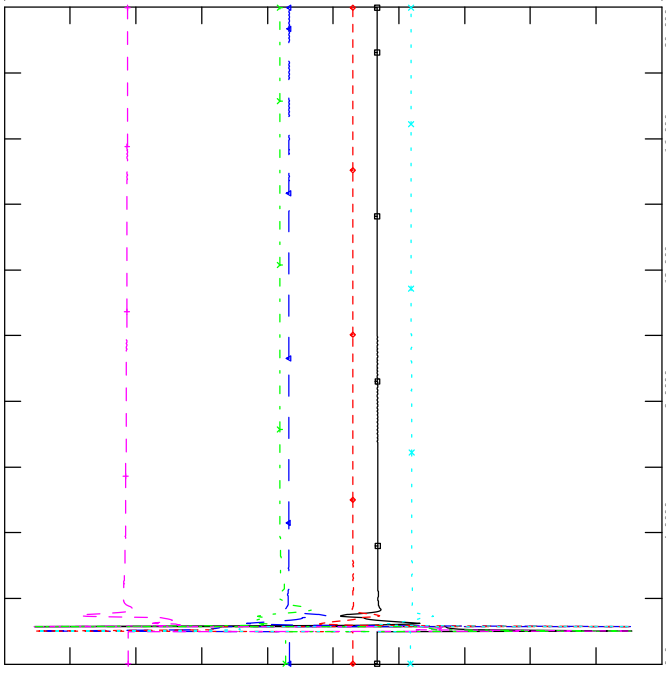
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-105.8 -498.8

CHNL# 37: [POWR 662 TO 720 CKT '64']
51.355 5.5904

CHNL# 35: [POWR 669 TO 720 CKT '64']
-81.97 -370.6

CHNL# 33: [POWR 477 TO 662 CKT '83']
-65.54 -267.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
267.50 65.536



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

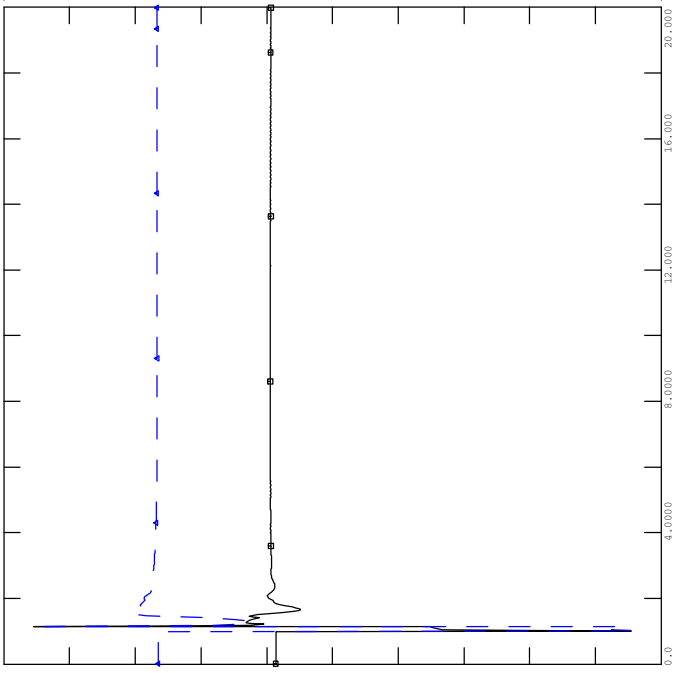
FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
58.156 -239.8

CHNL# 43: [POWR 669 TO 1012 CKT '35']
396.27 75.209



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

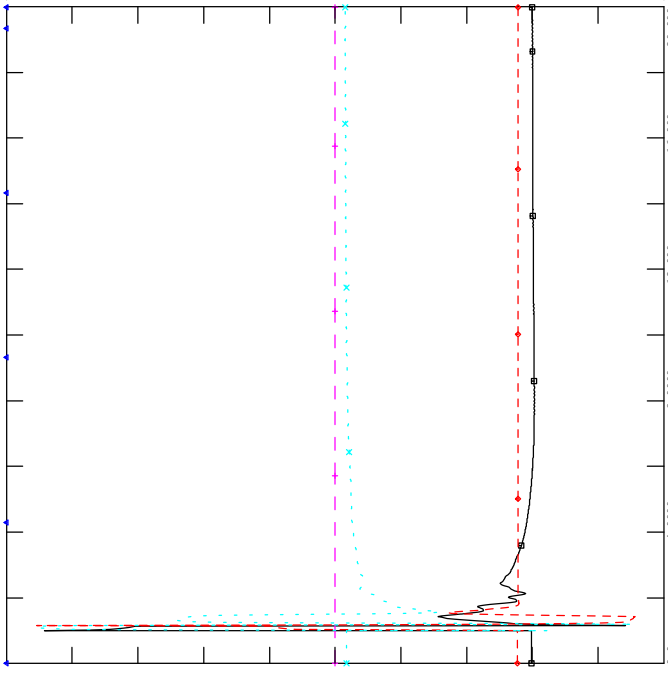
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.4665 0.24860

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.5330 -0.3976

CHNL# 11: [VARS 773[SECST 20.000]1]
0.27100 -0.3755

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.90110 0.03910



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_16_600L_BULLSHEAD

FILE: Scn3_SP_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
48.691 -240.9

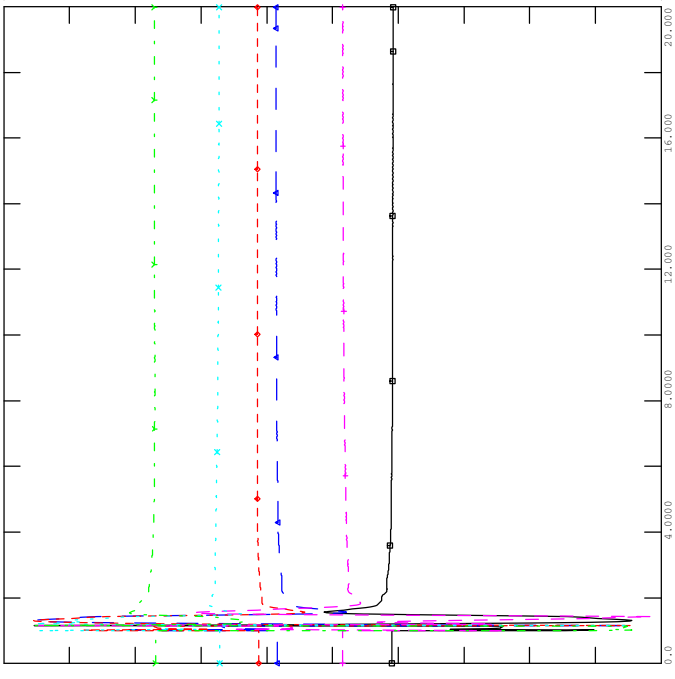
CHNL# 40: [VARS 669 TO 547004 CKT '74']
36.812 -153.2

CHNL# 38: [VARS 662 TO 720 CKT '64']
27.708 -10.28

CHNL# 36: [VARS 669 TO 720 CKT '64']
75.832 -92.90

CHNL# 34: [VARS 477 TO 662 CKT '83']
93.154 -63.95

CHNL# 32: [VARS 477 TO 547004 CKT '74']
93.859 -73.14



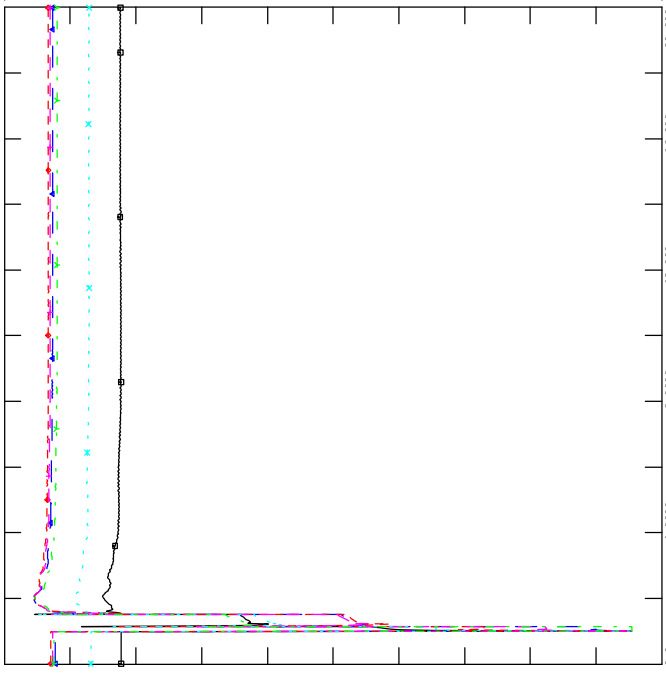
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0950 -0.0484
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0791 0.82760
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0904 0.44850
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1011 0.38250
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0970 0.22760
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0411 0.85910



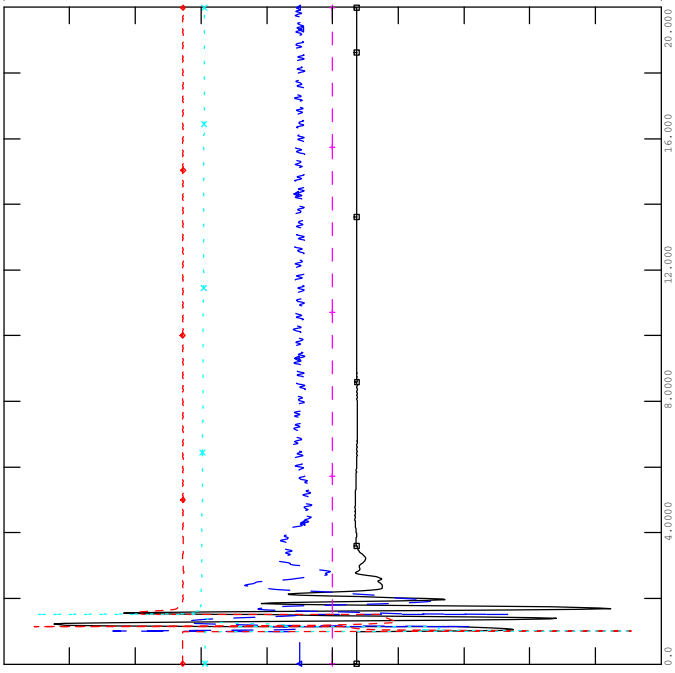
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8535 0.11660
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5649 0.54960
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0827 2.8524
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.64610 -0.0023



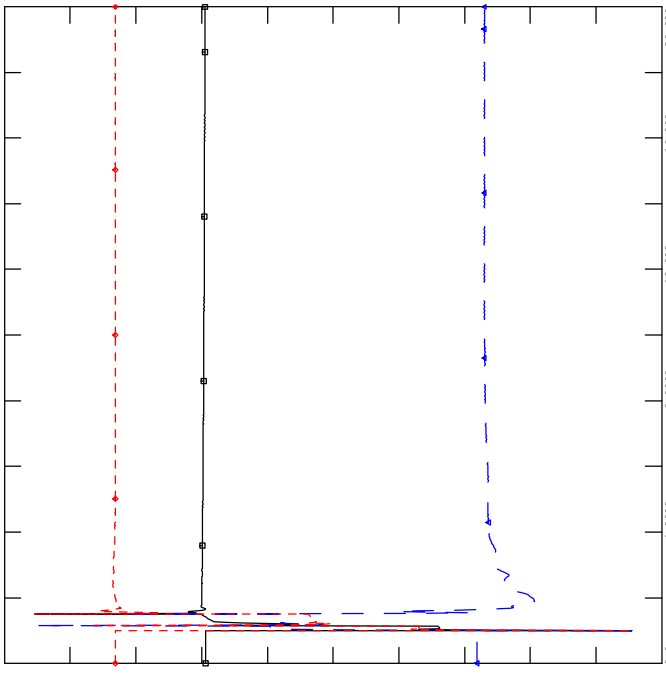
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1557 0.46870
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.1607 0.31820
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8535 0.11660



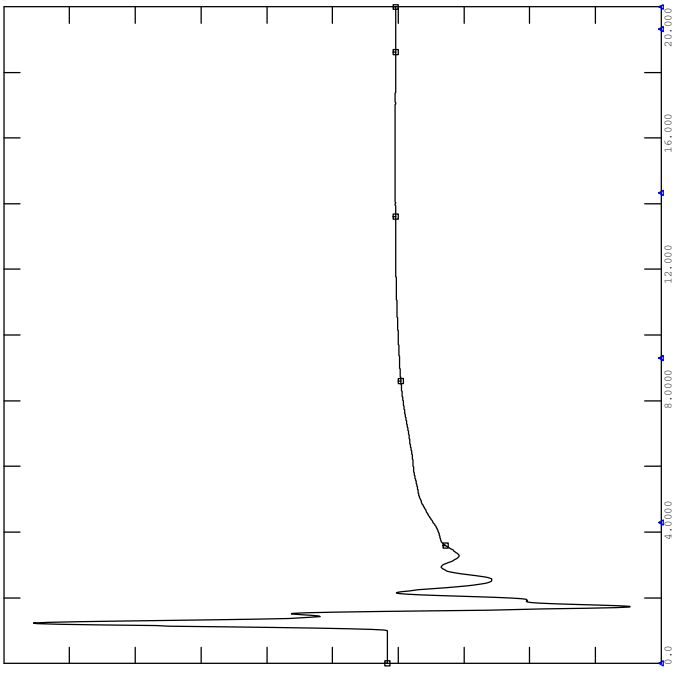
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.5091 -1.655
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 23.922 -35.47



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 318.86 45.096
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -65.41 -440.6
CHNL# 37: [POWR 662 TO 720 CKT '64'] 47.204 -1.017
CHNL# 35: [POWR 669 TO 720 CKT '64'] -57.39 -285.3
CHNL# 33: [POWR 477 TO 662 CKT '83'] -49.78 -206.3
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 206.26 49.783

TIME (SECONDS) 0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 14.148 -237.1
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 345.90 55.628

TIME (SECONDS) 0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.1607 0.31820
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 1.3406 -0.1515
CHNL# 11: [VARS 773[SECST 20.000]1] 0.32920 -0.2338
CHNL# 10: [VARS 713[CMH 14 13.800]14] 1.0018 0.16300

TIME (SECONDS) 0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_17_880L_ALR

FILE: Scn3_SP_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 6.8448 -238.4
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 52.878 -152.6
CHNL# 38: [VARS 662 TO 720 CKT '64'] 32.073 -4.137
CHNL# 36: [VARS 669 TO 720 CKT '64'] 93.340 -67.39
CHNL# 34: [VARS 477 TO 662 CKT '83'] 96.163 -29.11
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 48.511 -85.66

TIME (SECONDS) 0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

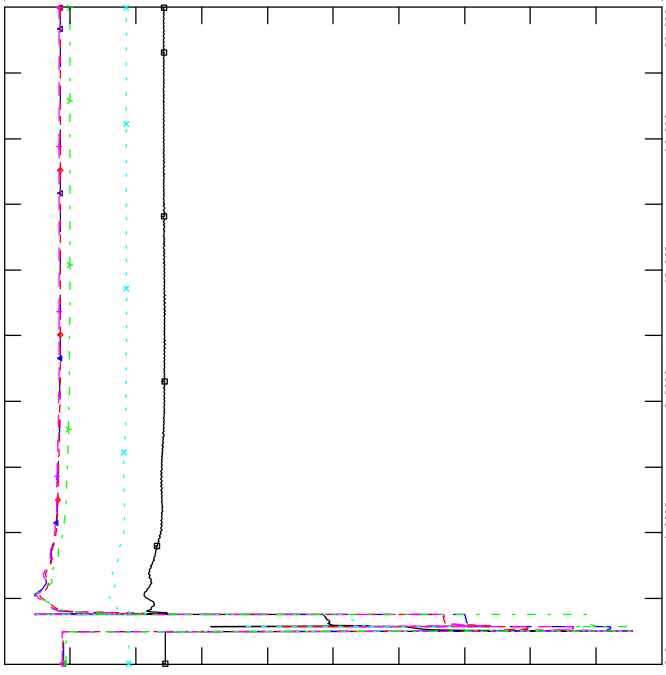
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0943 0.18120
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0895 0.86000
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0927 0.52850
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1062 0.48090
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0990 0.32920
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0500 0.88120



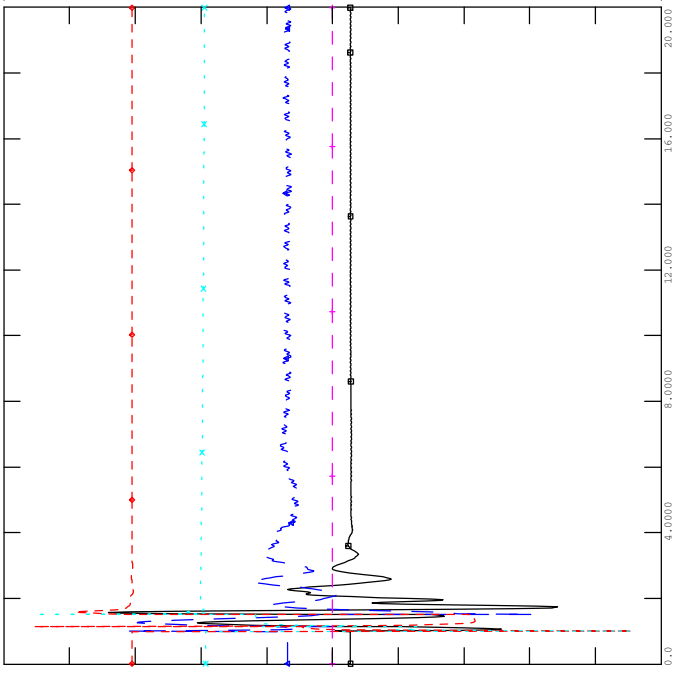
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.7411 0.37570
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3088 0.80650
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1227 2.7897
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.46660 0.14690



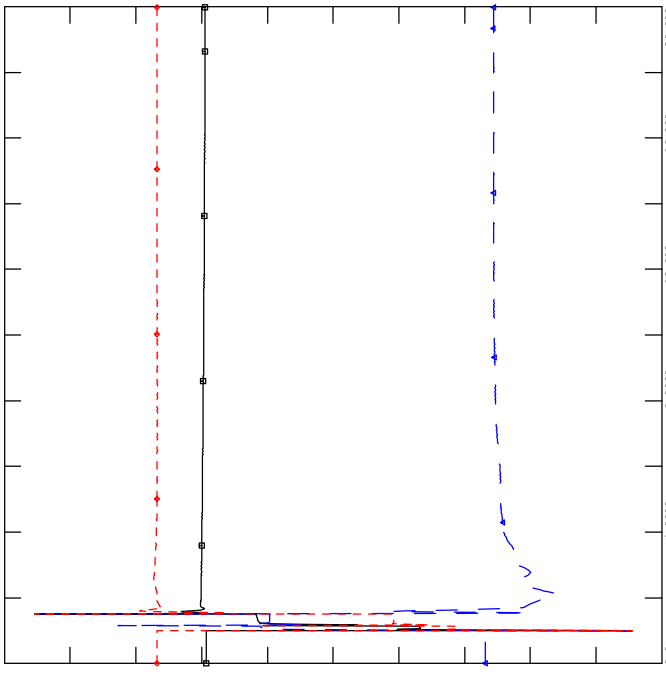
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1896 0.54480
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0659 0.38530
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.7411 0.37570



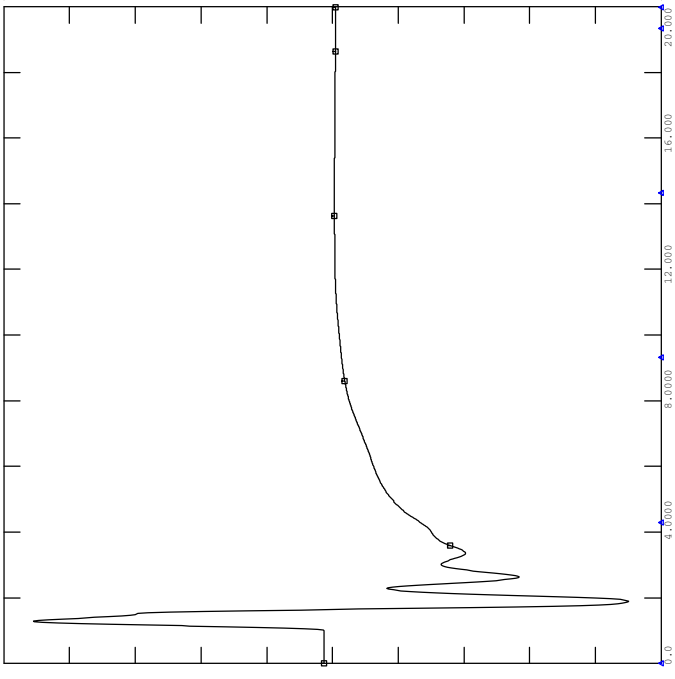
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2811 -1.366
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 8.3801 -30.87



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
330.93 63.650

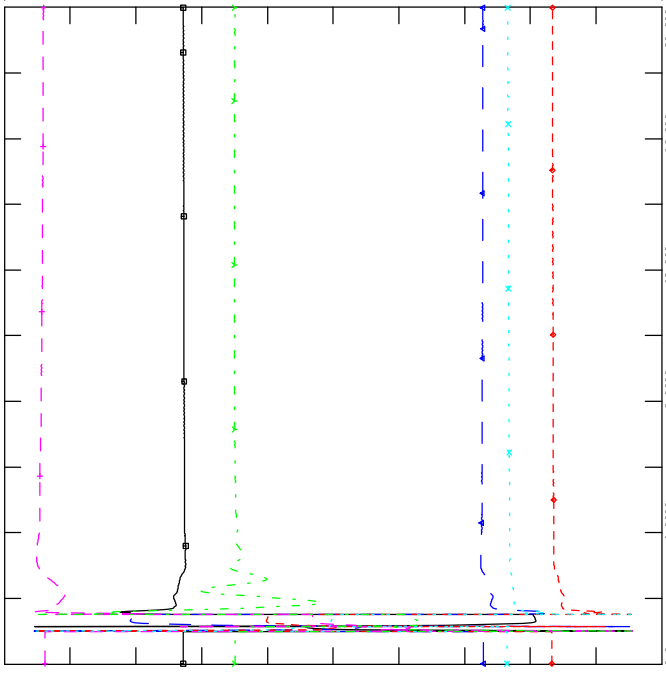
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-107.7 -422.7

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.206 5.6083

CHNL# 35: [POWR 669 TO 720 CKT '64']
-85.93 -264.6

CHNL# 33: [POWR 477 TO 662 CKT '83']
-68.85 -184.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
184.42 68.846



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

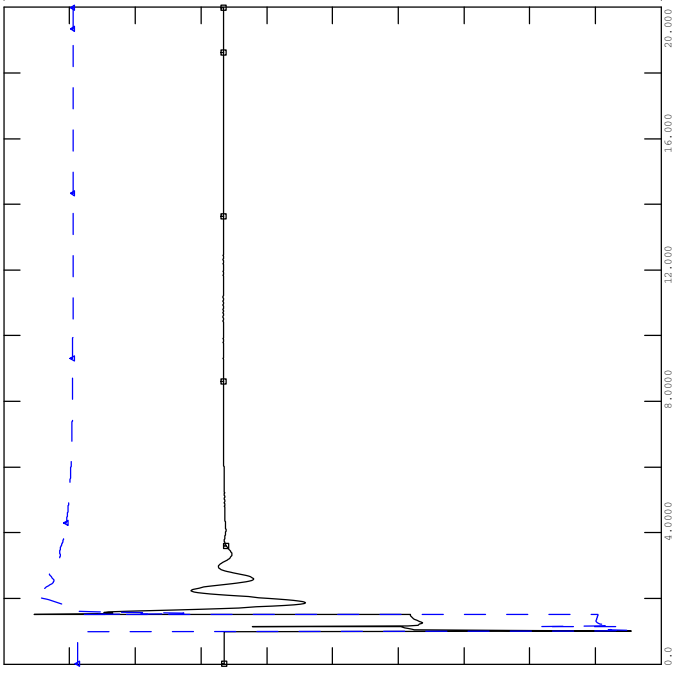
FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
16.802 -237.9

CHNL# 43: [POWR 669 TO 1012 CKT '35']
357.84 76.212



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

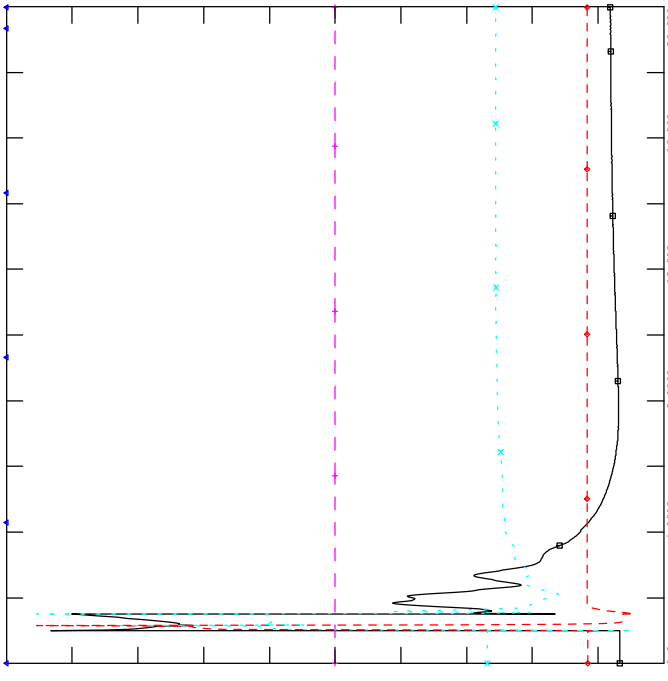
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.0659 0.38530

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.0766 -0.1036

CHNL# 11: [VARS 773[SECST 20.000]1]
0.27160 -0.2105

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.90420 0.16300



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_18_880L_BULLSHEAD

FILE: Scn3_SP_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
9.7214 -239.1

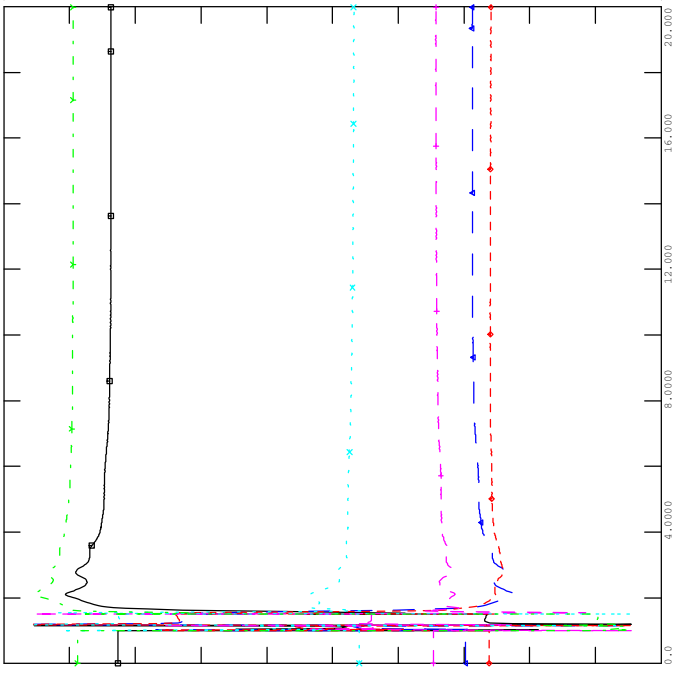
CHNL# 40: [VARS 669 TO 547004 CKT '74']
36.884 -78.79

CHNL# 38: [VARS 662 TO 720 CKT '64']
28.779 -2.819

CHNL# 36: [VARS 669 TO 720 CKT '64']
76.057 -12.87

CHNL# 34: [VARS 477 TO 662 CKT '83']
80.481 5.4911

CHNL# 32: [VARS 477 TO 547004 CKT '74']
9.1991 -70.82



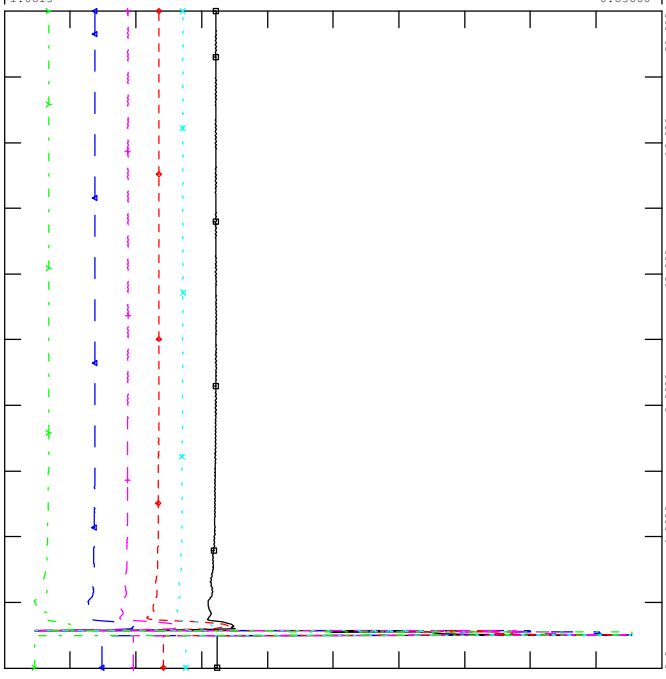
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0601 -0.0467
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1304 0.82430
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1900 0.44170
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2670 0.37190
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1708 0.22150
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0815 0.85660



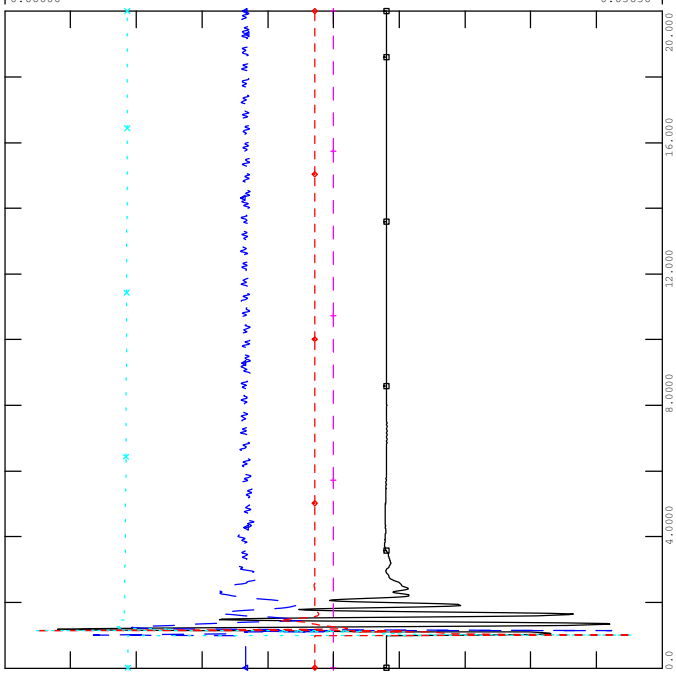
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.4511 0.12980
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.3628 0.50440
CHNL# 6: [POWR 773[SECST 20.000]1] 3.0828 2.7996
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.66000 0.03650



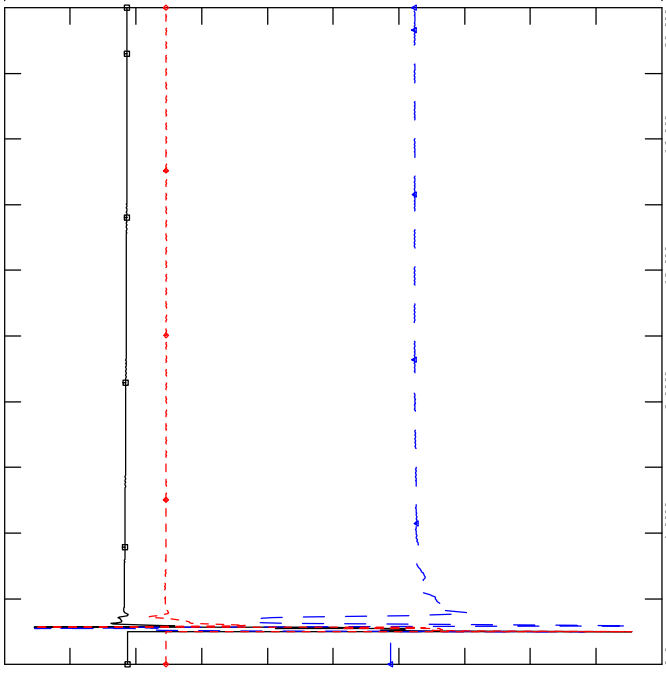
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2282 0.46320
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7040 0.22730
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.4511 0.12980



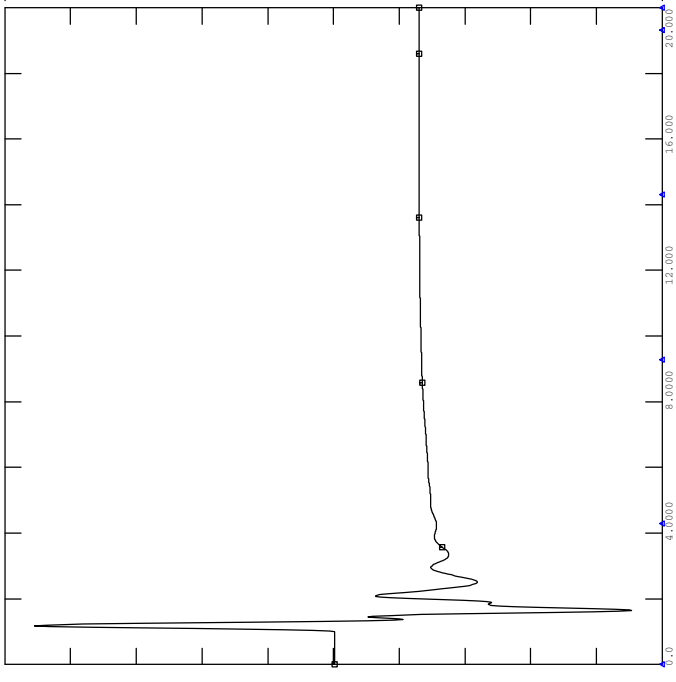
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2437 -0.8620
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 11.802 -33.15



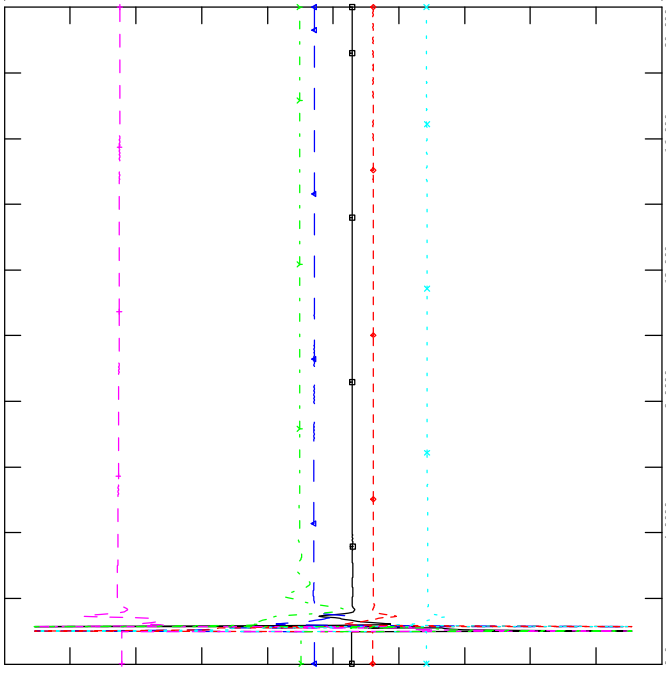
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
398.70 40.801
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-61.05 -509.3
CHNL# 37: [POWR 662 TO 720 CKT '64']
52.338 -1.433
CHNL# 35: [POWR 669 TO 720 CKT '64']
-52.20 -378.3
CHNL# 33: [POWR 477 TO 662 CKT '83']
-46.07 -272.9
CHNL# 31: [POWR 477 TO 547004 CKT '74']
272.85 46.064



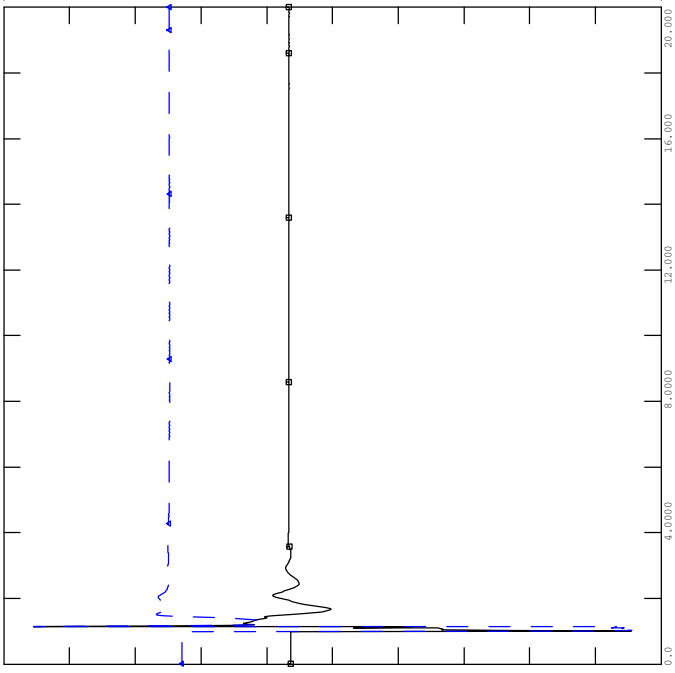
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
72.798 -239.8
CHNL# 43: [POWR 669 TO 1012 CKT '35']
427.88 51.180



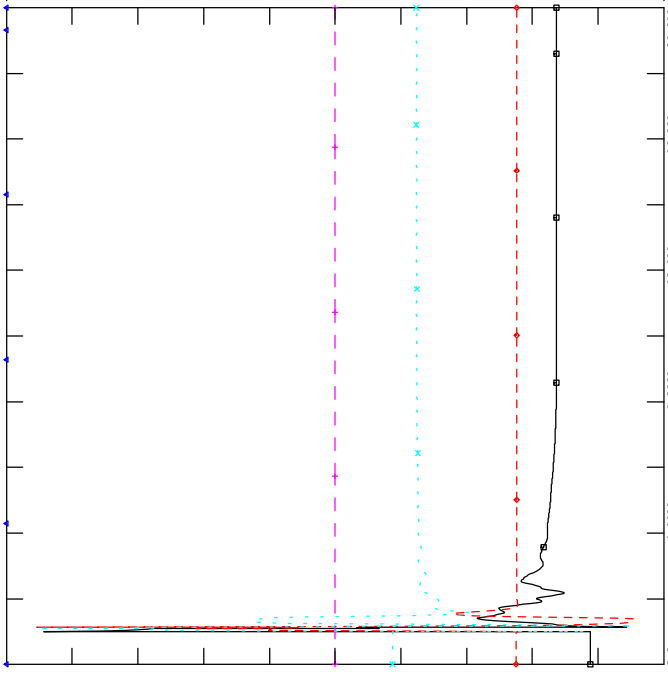
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.7040 0.22730
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.5061 -0.3938
CHNL# 11: [VARS 773[SECST 20.000]1]
0.33120 -0.3733
CHNL# 10: [VARS 713[CMH 14 13.800]14]
1.0017 0.11340



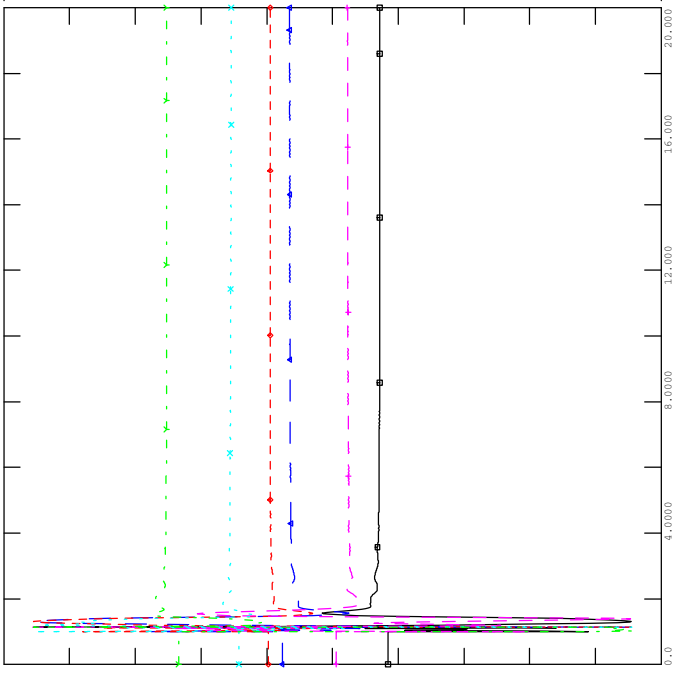
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_19_675L_ALR

FILE: Scn3_SP_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
62.611 -240.9
CHNL# 40: [VARS 669 TO 547004 CKT '74']
38.980 -141.6
CHNL# 38: [VARS 662 TO 720 CKT '64']
26.309 -9.657
CHNL# 36: [VARS 669 TO 720 CKT '64']
75.209 -85.94
CHNL# 34: [VARS 477 TO 662 CKT '83']
92.663 -60.56
CHNL# 32: [VARS 477 TO 547004 CKT '74']
90.809 -72.69



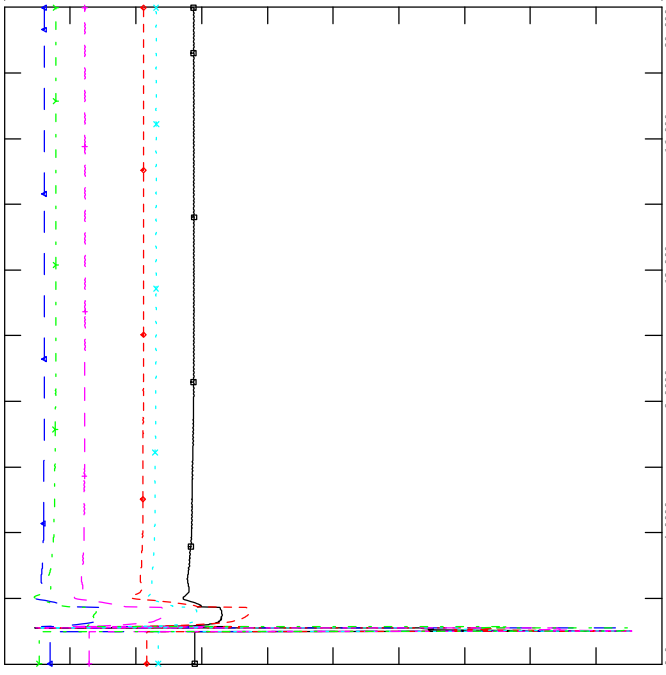
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]1] 1.0599 0.10050
CHNL# 26: [VOLT 918 [CASS01 240.00]1] 1.1402 0.73770
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]1] 1.1617 0.24550
CHNL# 24: [VOLT 662 [WHITLA1 240.00]1] 1.3010 0.14550
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]1] 1.1103 -0.0470
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]1] 1.0955 0.79580



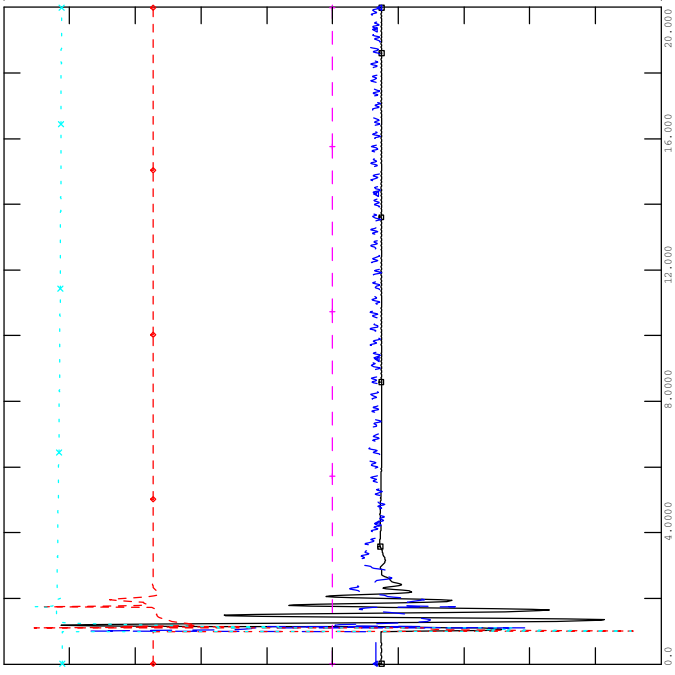
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2237 -0.1059
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5549 0.17980
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1191 2.8714
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.62510 0.05540



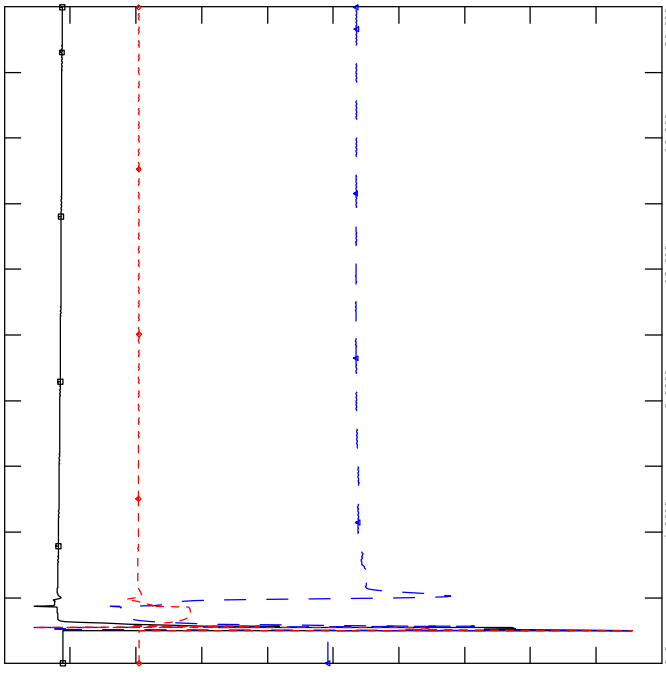
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2362 0.27590
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.4489 0.20440
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2237 -0.1059



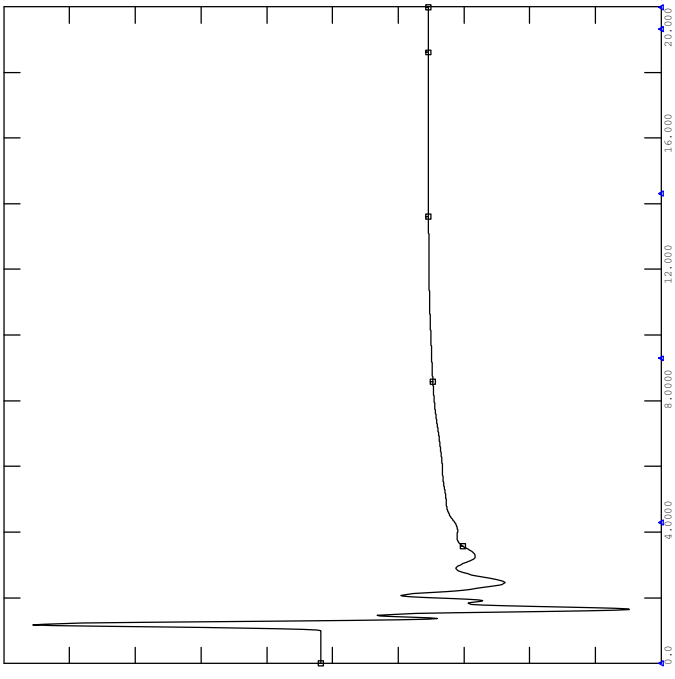
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 1.5793 -0.7184
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 6.2705 -29.02



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
269.30 -22.76

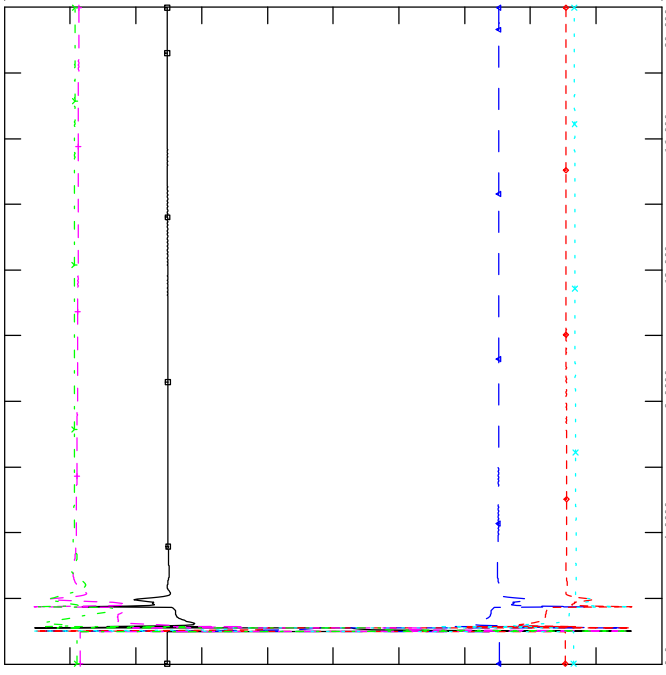
CHNL# 39: [POWR 669 TO 547004 CKT '74']
21.586 -405.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
50.535 -16.81

CHNL# 35: [POWR 669 TO 720 CKT '64']
19.244 -278.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
19.290 -209.7

CHNL# 31: [POWR 477 TO 547004 CKT '74']
209.67 -19.29



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

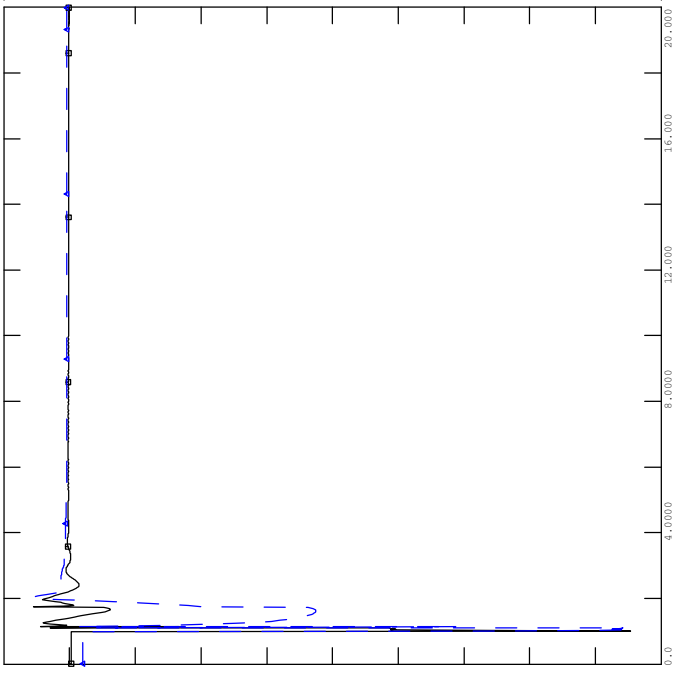
FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
16.857 -221.4

CHNL# 43: [POWR 669 TO 1012 CKT '35']
295.41 -16.94



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

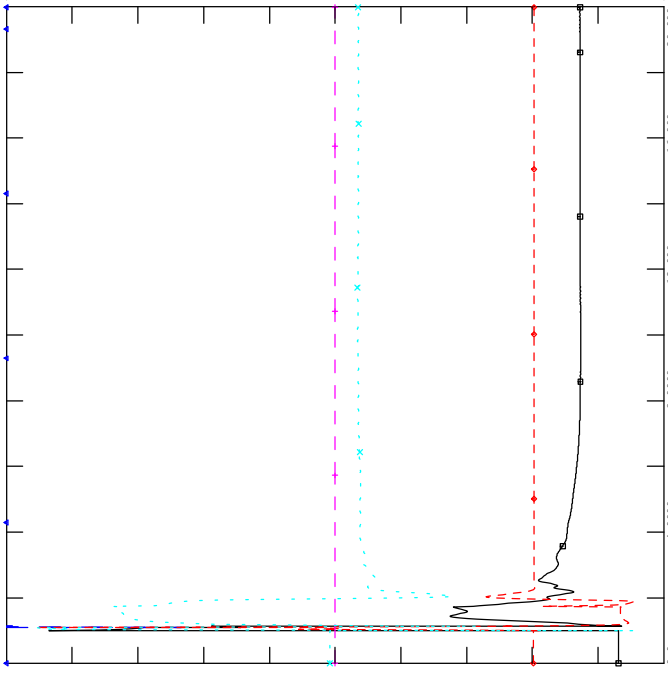
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.4489 0.20440

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.1865 -0.4996

CHNL# 11: [VARS 773[SECST 20.000]1]
0.51860 -0.4835

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.93480 0.15950



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_20_675L_BOWMANTON

FILE: Scn3_SP_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
9.6230 -222.5

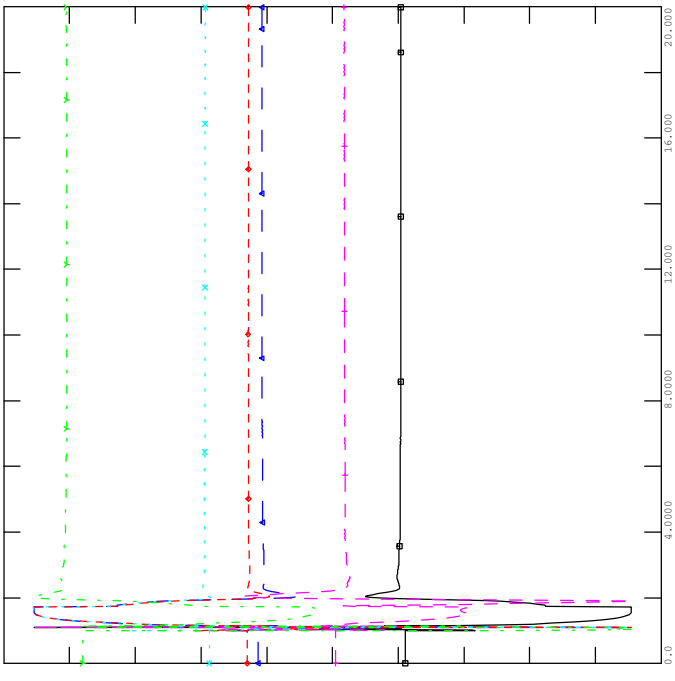
CHNL# 40: [VARS 669 TO 547004 CKT '74']
89.473 -279.0

CHNL# 38: [VARS 662 TO 720 CKT '64']
33.600 -16.85

CHNL# 36: [VARS 669 TO 720 CKT '64']
139.55 -209.2

CHNL# 34: [VARS 477 TO 662 CKT '83']
145.21 -158.4

CHNL# 32: [VARS 477 TO 547004 CKT '74']
188.45 -128.0



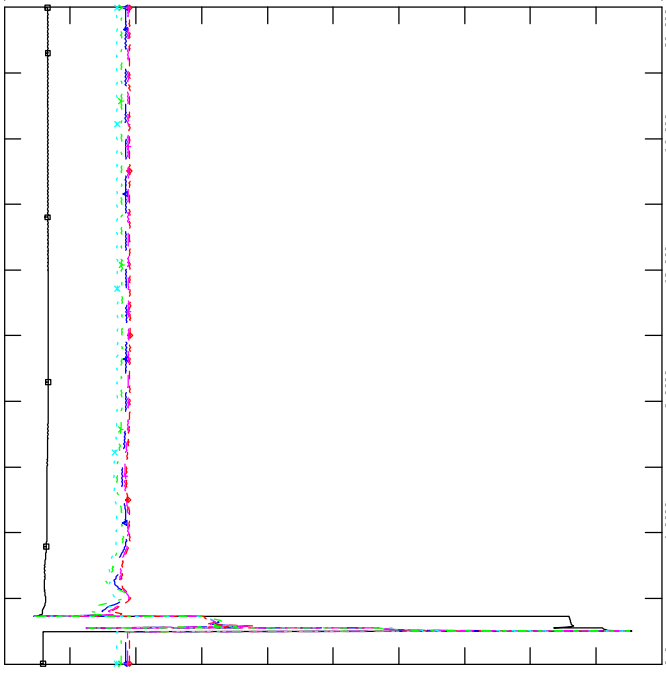
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0227 0.94620
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0644 0.95700
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0636 0.95530
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0728 0.95580
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0471 0.95270
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0330 0.62220



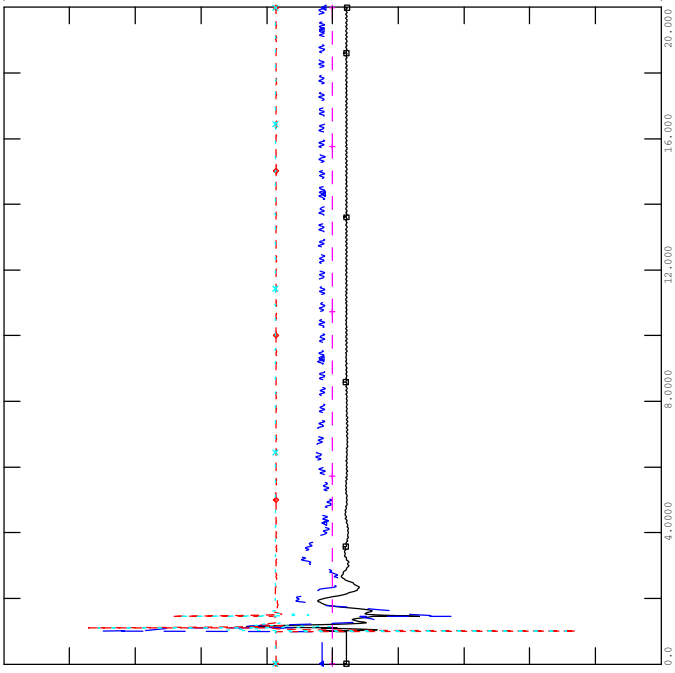
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1610 1.8100
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.1790 1.7854
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1164 2.8324
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.36840 0.23330



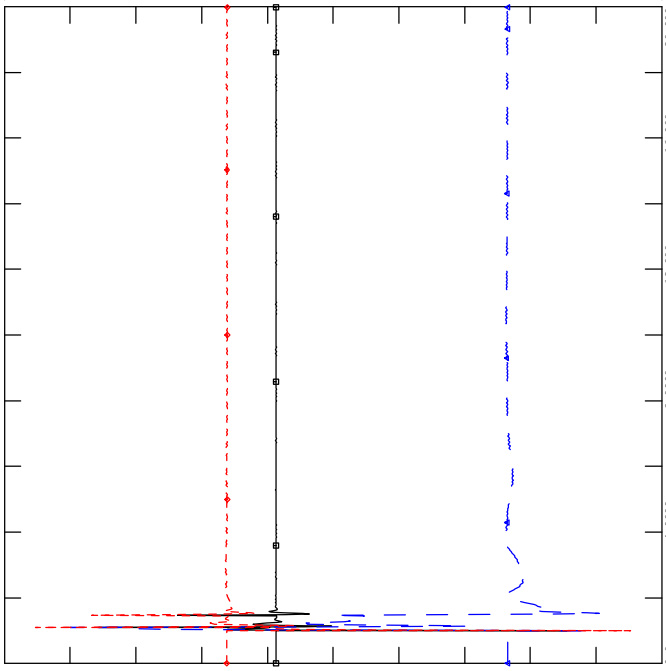
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0842 0.95360
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2222 0.71850
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1610 1.8100



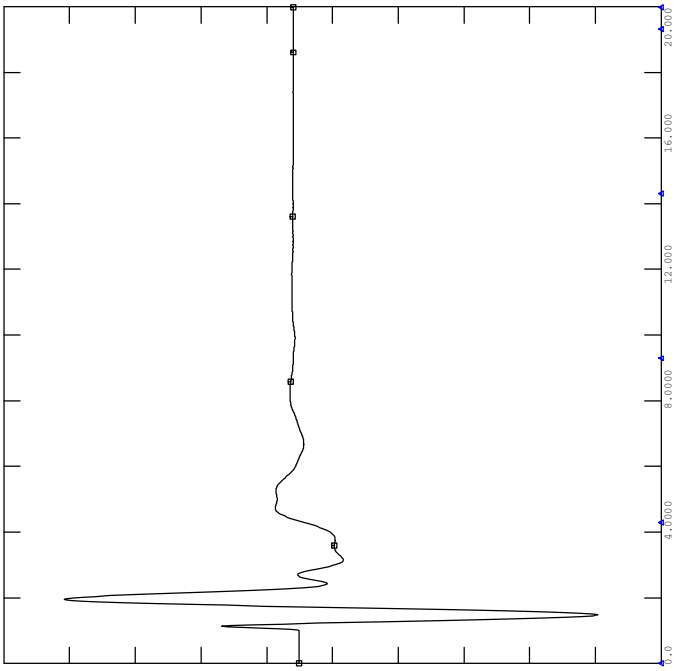
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.2708 -1.964
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -8.108 -13.96



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
253.22 217.26

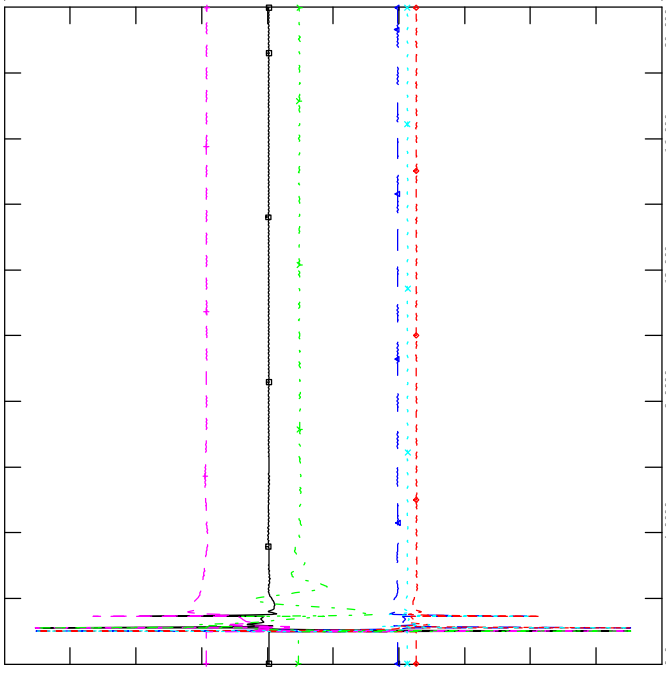
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-316.6 -368.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
44.644 38.513

CHNL# 35: [POWR 669 TO 720 CKT '64']
-212.1 -248.3

CHNL# 33: [POWR 477 TO 662 CKT '83']
-137.8 -163.3

CHNL# 31: [POWR 477 TO 547004 CKT '74']
163.27 137.79



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

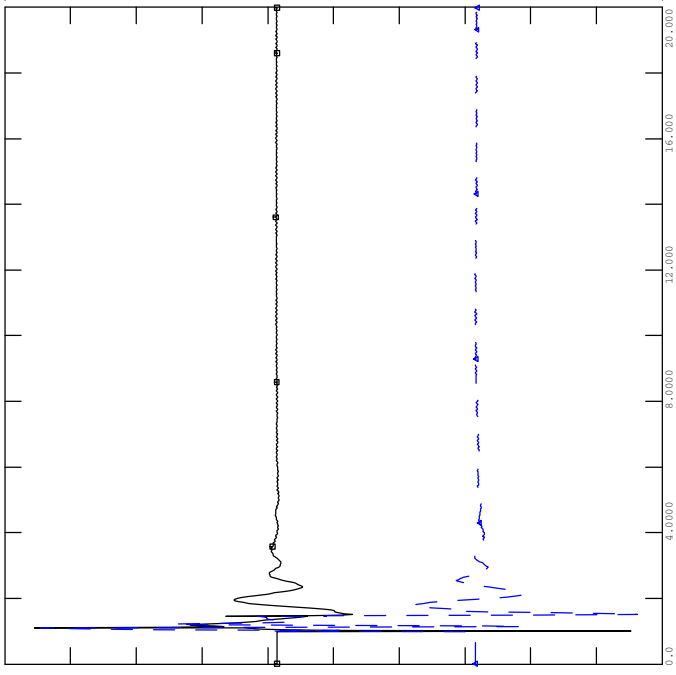
FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-6.312 -13.97

CHNL# 43: [POWR 669 TO 1012 CKT '35']
279.85 240.34



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

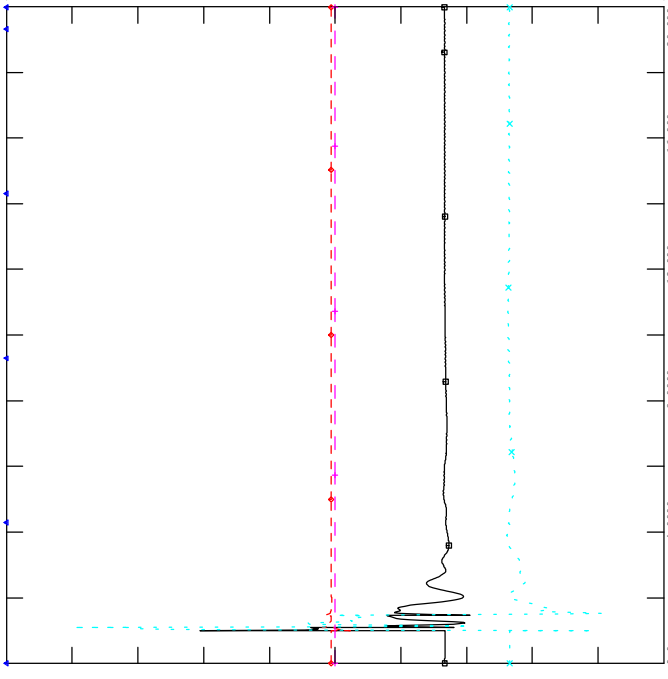
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2222 0.71850

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.08500 -0.0195

CHNL# 11: [VARS 773[SECST 20.000]1]
0.20220 -0.2717

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.32690 0.15600



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_21_879L_BURDETT

FILE: Scn3_SP_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-8.712 -20.71

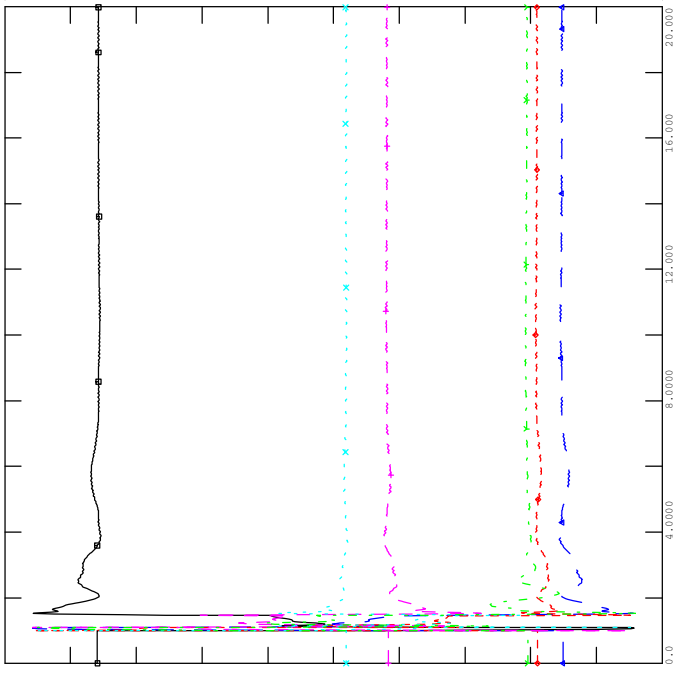
CHNL# 40: [VARS 669 TO 547004 CKT '74']
-7.059 -42.81

CHNL# 38: [VARS 662 TO 720 CKT '64']
12.493 5.0316

CHNL# 36: [VARS 669 TO 720 CKT '64']
21.368 7.8257

CHNL# 34: [VARS 477 TO 662 CKT '83']
41.051 25.428

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-2.213 -19.73



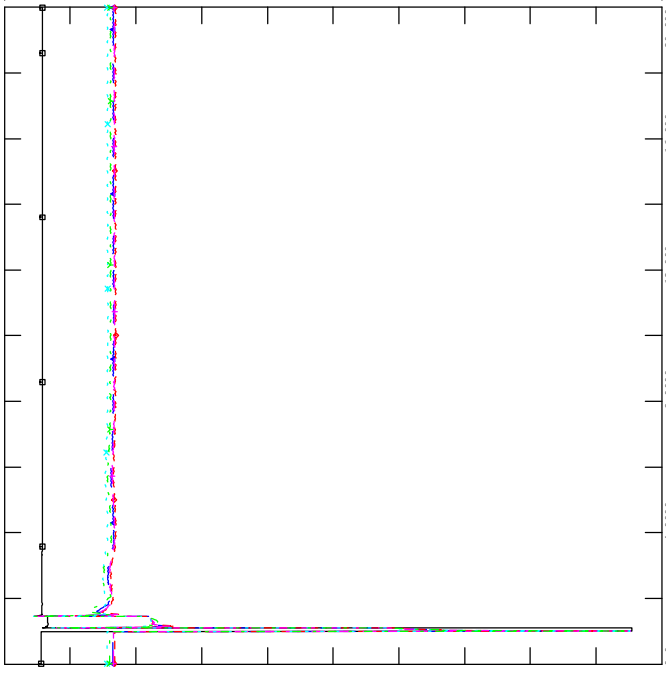
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0258 0.92170
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0689 0.92290
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0676 0.92110
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0771 0.91870
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0508 0.92280
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0697 -0.0305



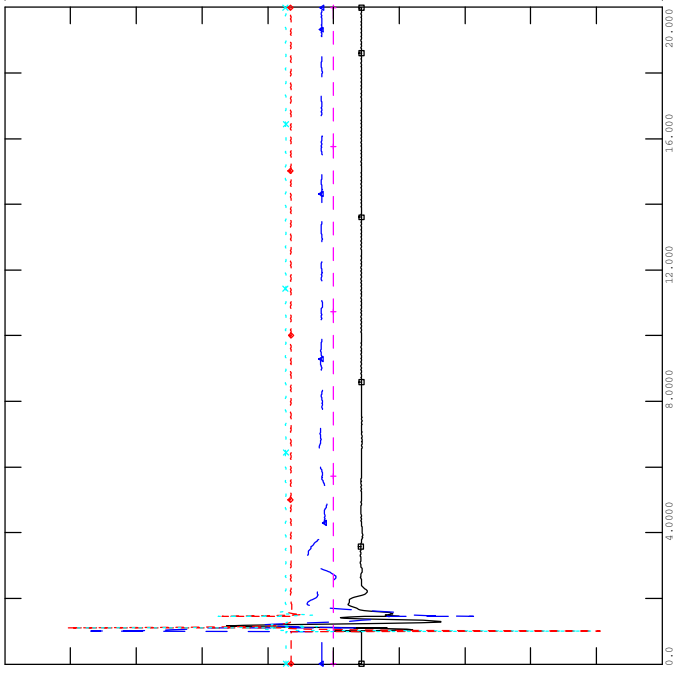
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2156 1.7486
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2488 1.7138
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1227 2.8245
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.37830 0.23020



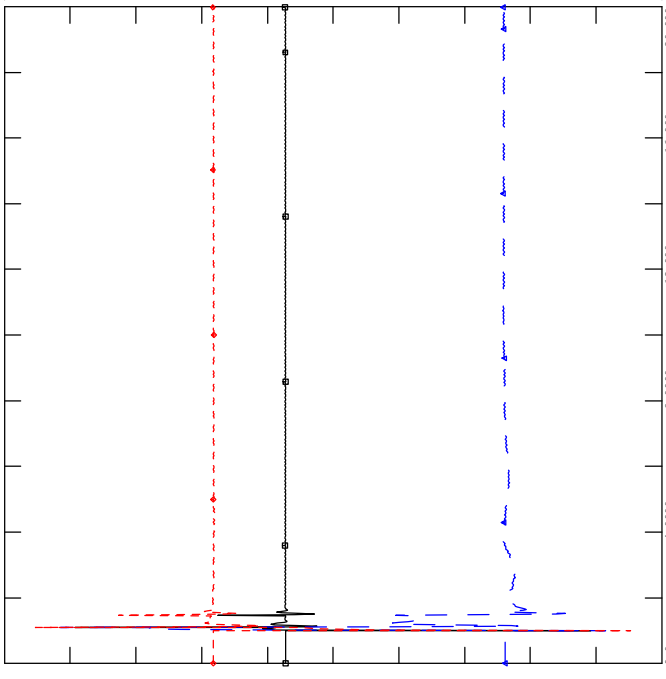
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0960 0.91980
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2849 0.69650
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2156 1.7486



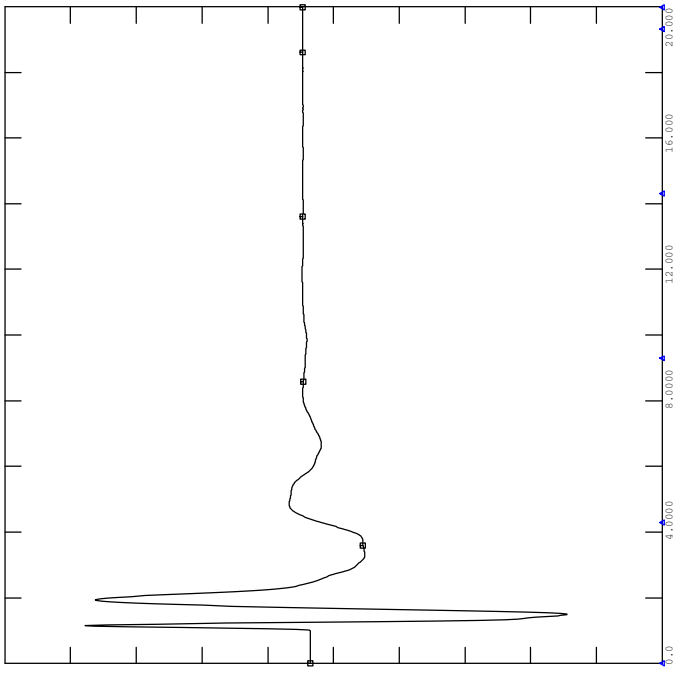
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 1.9292 -1.667
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -8.911 -12.83



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
260.15 209.06

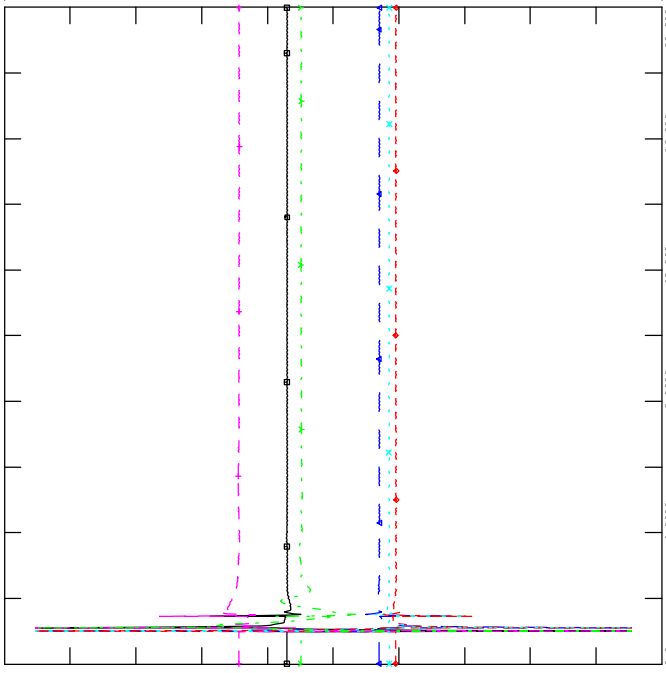
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-303.8 -380.4

CHNL# 37: [POWR 662 TO 720 CKT '64']
46.065 36.796

CHNL# 35: [POWR 669 TO 720 CKT '64']
-203.0 -256.4

CHNL# 33: [POWR 477 TO 662 CKT '83']
-131.7 -169.1

CHNL# 31: [POWR 477 TO 547004 CKT '74']
169.14 131.67



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

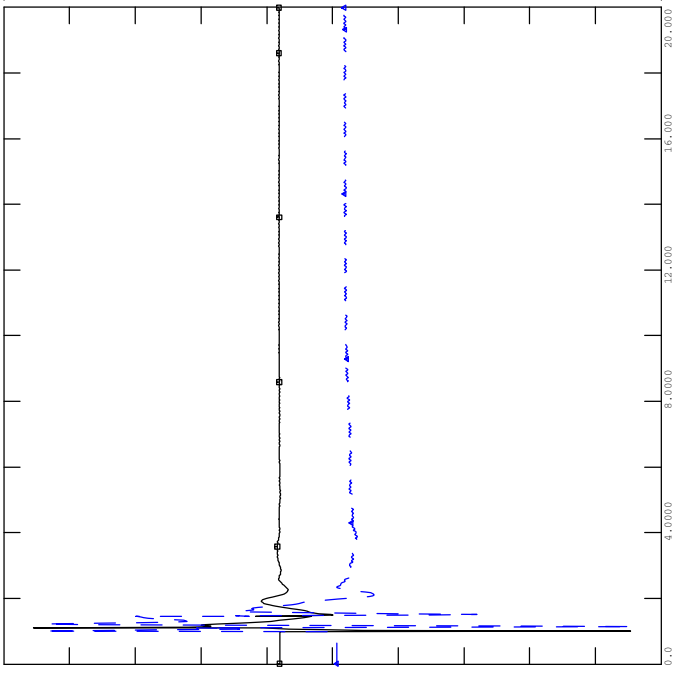
FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-8.471 -15.03

CHNL# 43: [POWR 669 TO 1012 CKT '35']
287.04 230.88



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

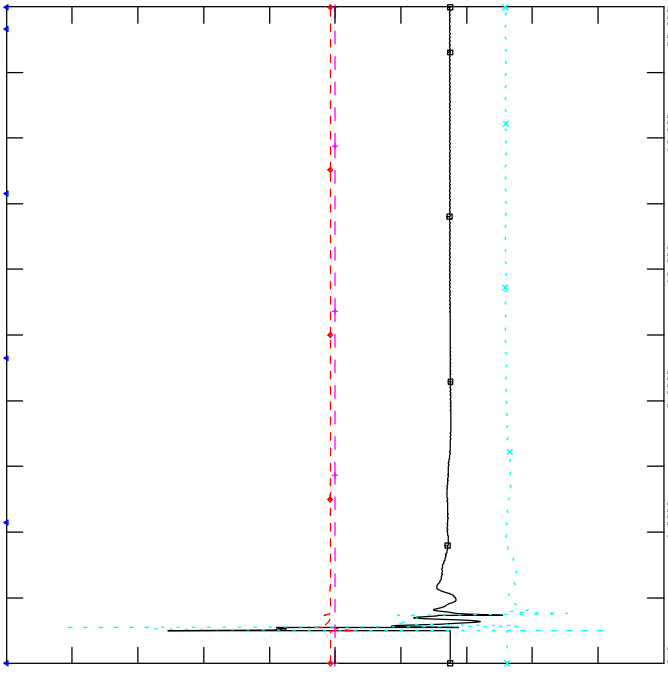
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2849 0.69650

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.08580 -0.0207

CHNL# 11: [VARS 773[SECST 20.000]1]
0.20950 -0.2264

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.35130 0.14640



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_22_879L_BOWMANTON

FILE: Scn3_SP_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-9.573 -21.68

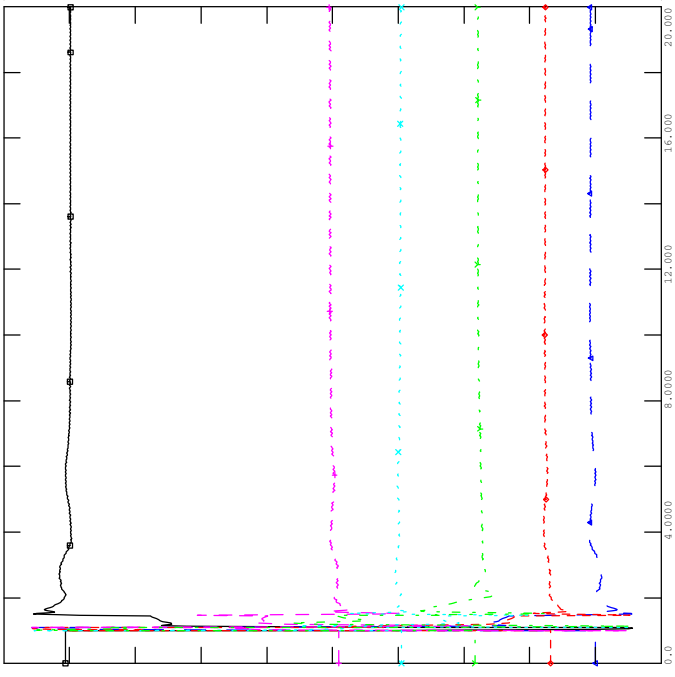
CHNL# 40: [VARS 669 TO 547004 CKT '74']
-0.3661 -42.10

CHNL# 38: [VARS 662 TO 720 CKT '64']
12.496 3.9573

CHNL# 36: [VARS 669 TO 720 CKT '64']
26.508 7.1226

CHNL# 34: [VARS 477 TO 662 CKT '83']
46.619 25.702

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-2.437 -26.29



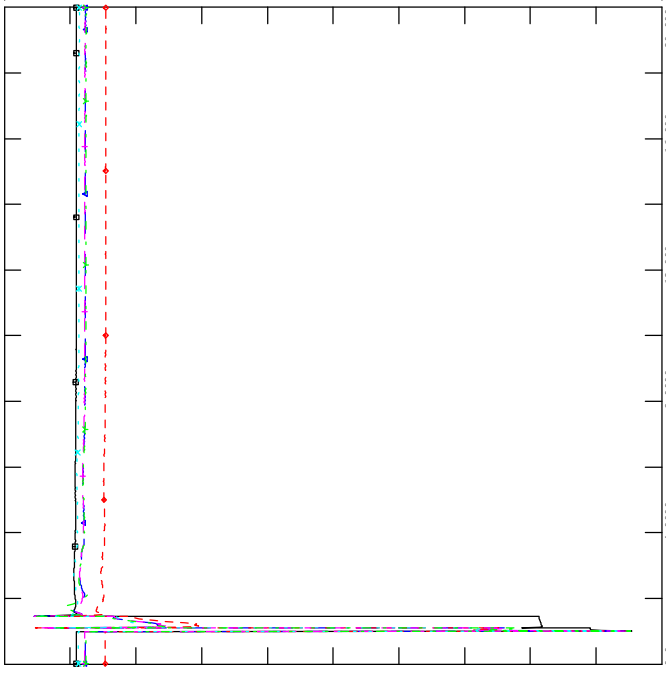
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0404 0.78710
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0854 0.73660
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0862 0.73360
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1120 0.71230
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0676 0.75850
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0982 0.27670



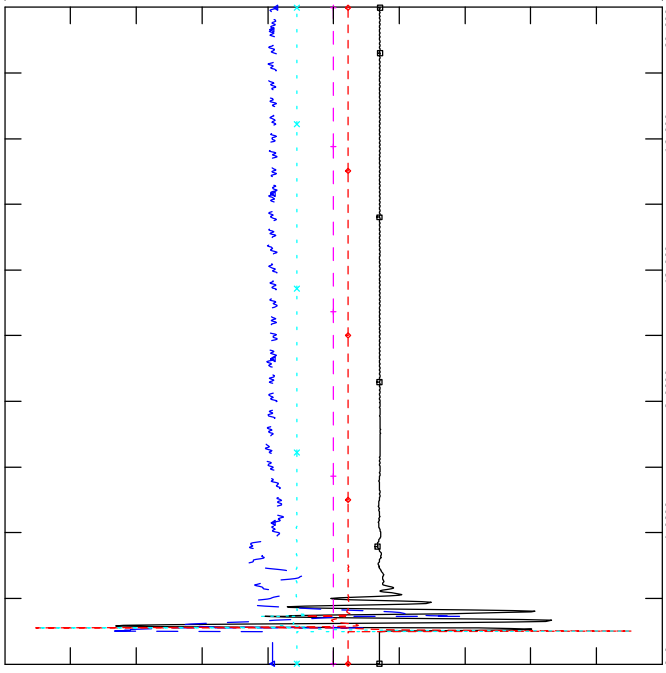
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6451 1.2288
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.8081 1.2914
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1131 2.7838
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.46630 0.17110



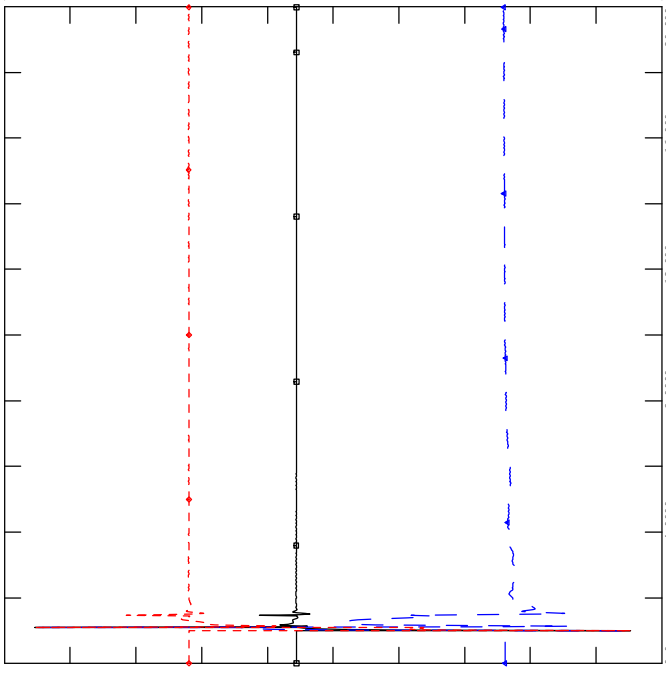
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1588 0.73490
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7431 0.55250
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6451 1.2288



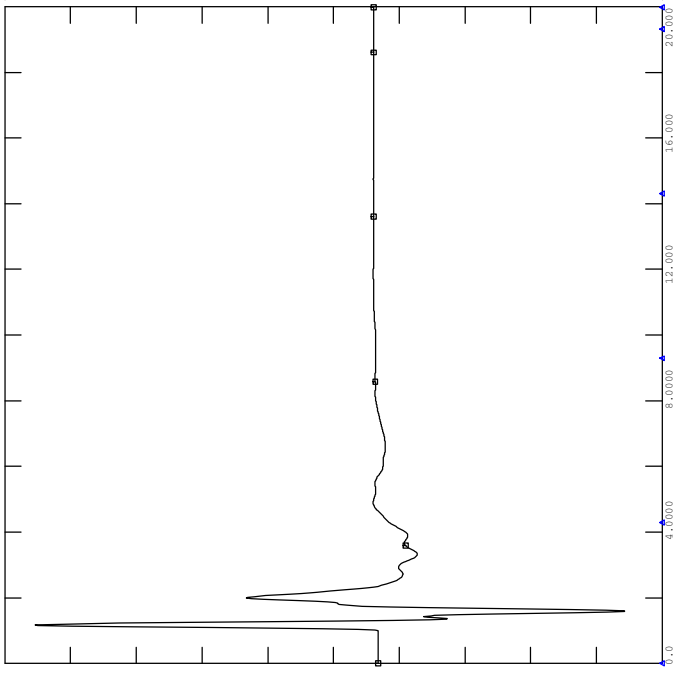
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 2.3472 -2.299
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -2.802 -16.77



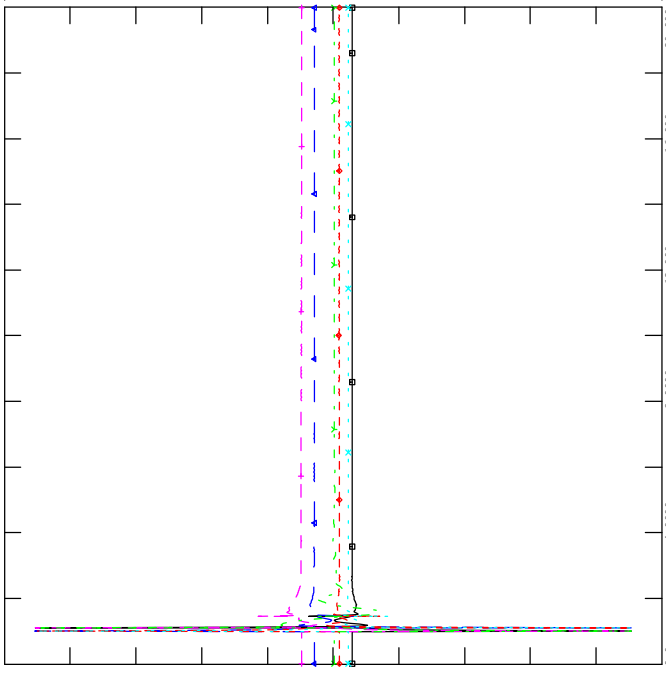
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 325.63 149.06
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -218.5 -467.3
CHNL# 37: [POWR 662 TO 720 CKT '64'] 58.270 23.938
CHNL# 35: [POWR 669 TO 720 CKT '64'] -148.4 -318.1
CHNL# 33: [POWR 477 TO 662 CKT '83'] -99.58 -213.0
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 213.00 99.574



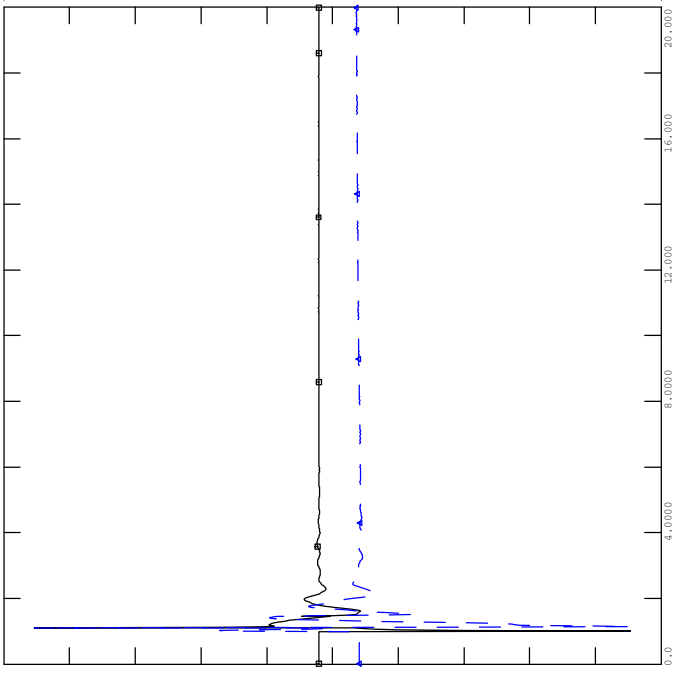
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 7.7394 -28.39
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 353.83 165.35



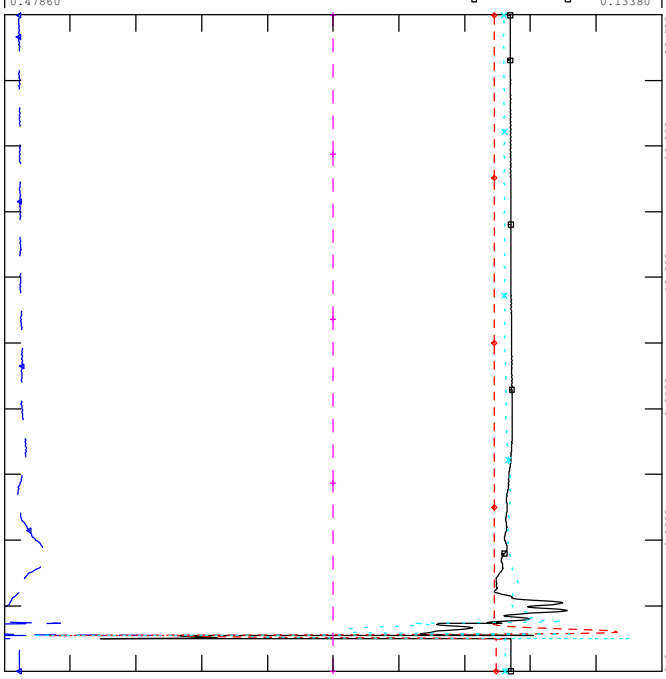
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1] 1.7431 0.55250
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.58690 -0.1533
CHNL# 11: [VARS 773[SECST 20.000]1] 0.57920 -0.3754
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.47860 0.13380



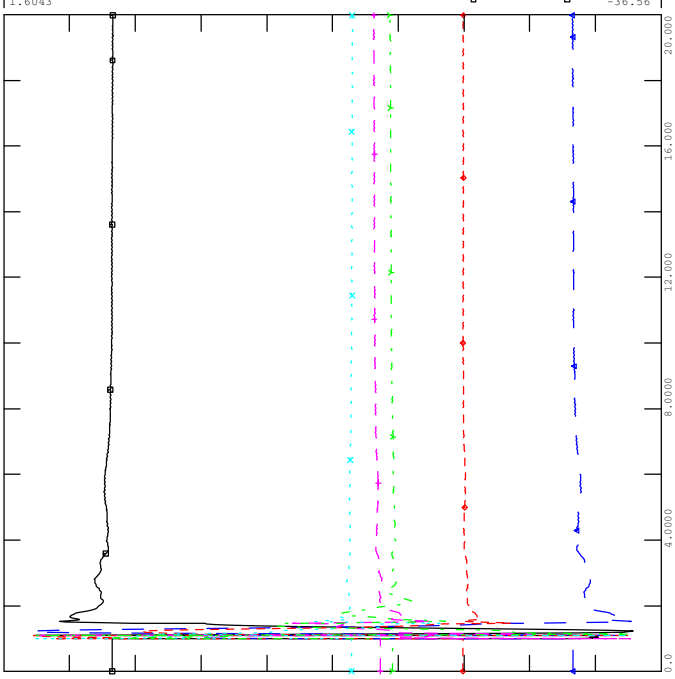
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_23_658L_CYPRESS

FILE: Scn3_SP_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 3.2724 -33.14
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 27.525 -72.94
CHNL# 38: [VARS 662 TO 720 CKT '64'] 20.104 -0.7846
CHNL# 36: [VARS 669 TO 720 CKT '64'] 45.941 -4.945
CHNL# 34: [VARS 477 TO 662 CKT '83'] 57.625 23.174
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 1.6043 -36.56



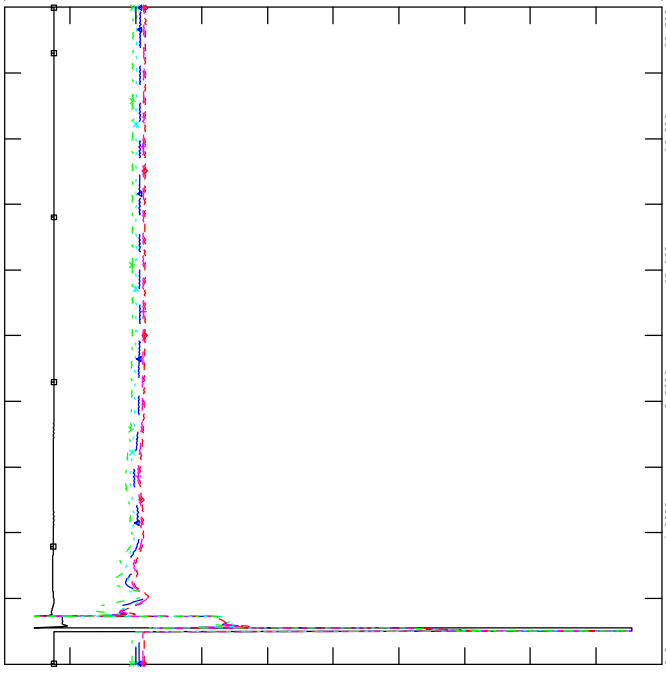
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0306 0.91970
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0775 0.92010
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0766 0.91820
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0870 0.91560
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0579 0.92030
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0950 -0.0521



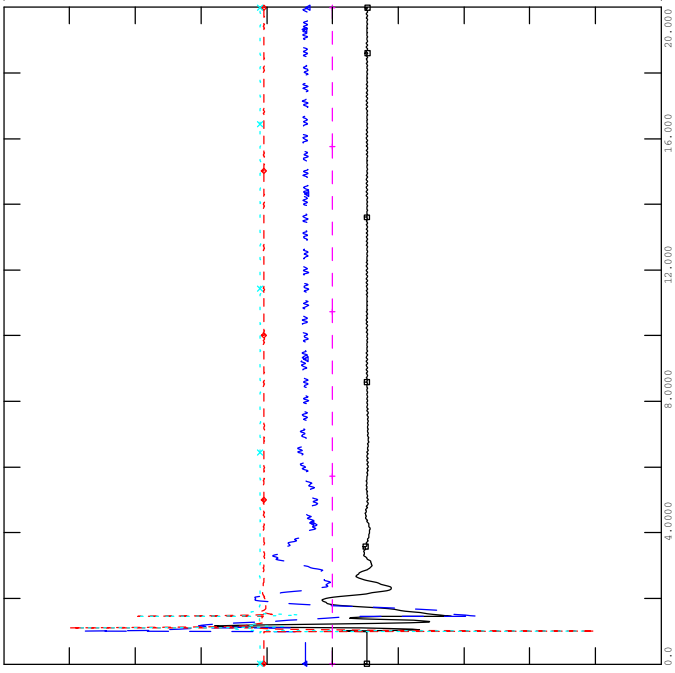
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1897 1.7442
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2171 1.7087
CHNL# 6: [POWR 773[SECST 20.000]1] 3.1238 2.8079
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.38410 0.22820



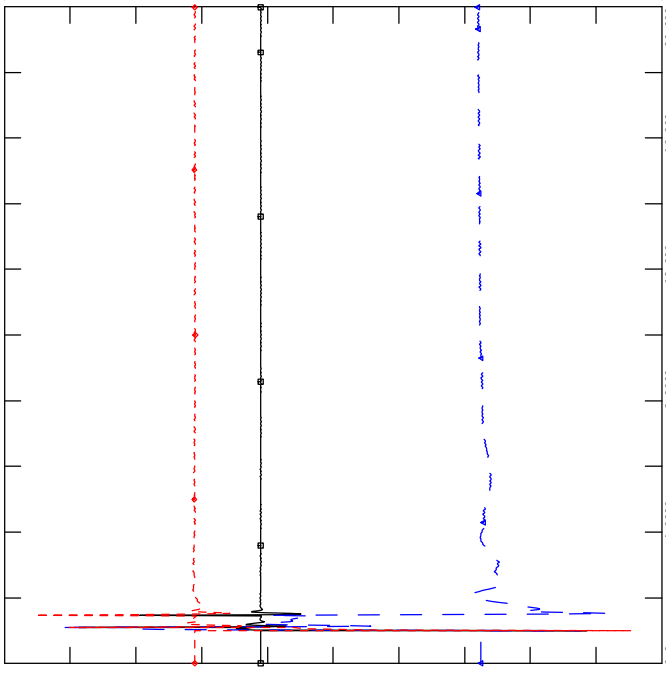
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0898 0.91770
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2734 0.67060
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1897 1.7442



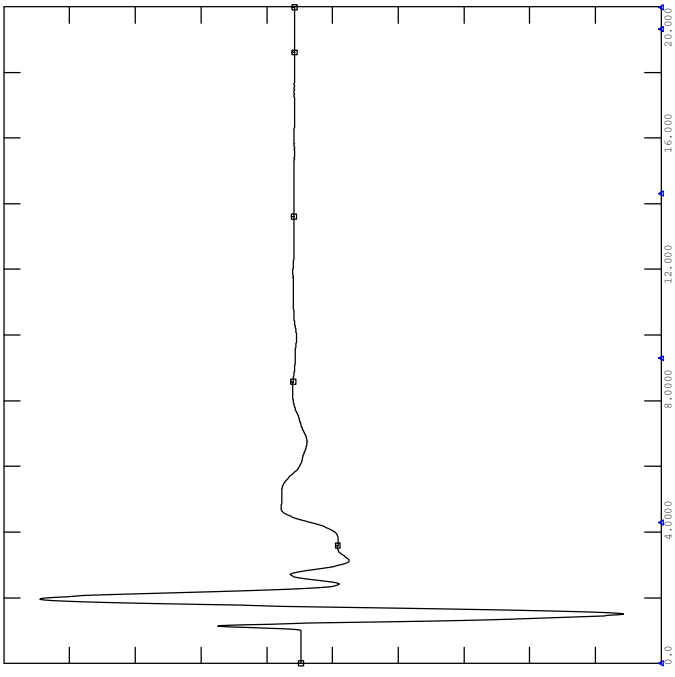
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] 3.3874 -2.786
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -6.285 -16.14



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
258.58 208.55

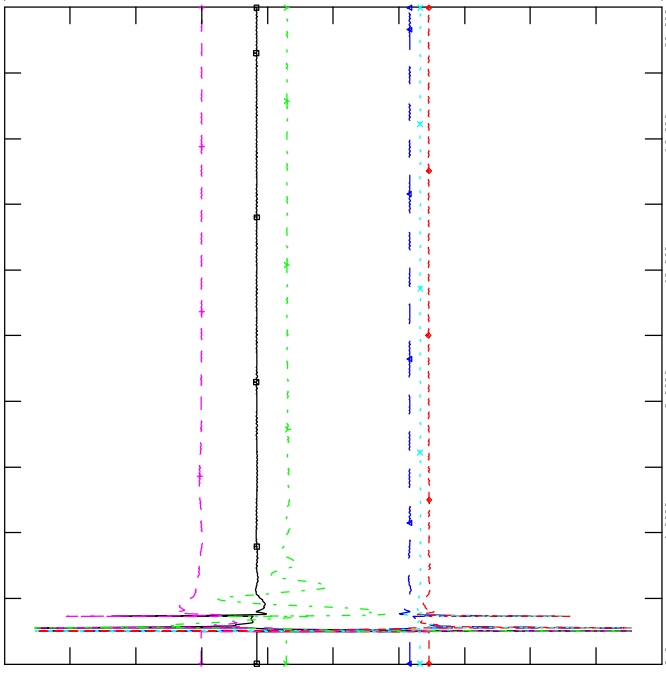
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-303.2 -375.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.346 36.712

CHNL# 35: [POWR 669 TO 720 CKT '64']
-202.6 -252.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
-131.4 -166.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
166.51 131.37



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

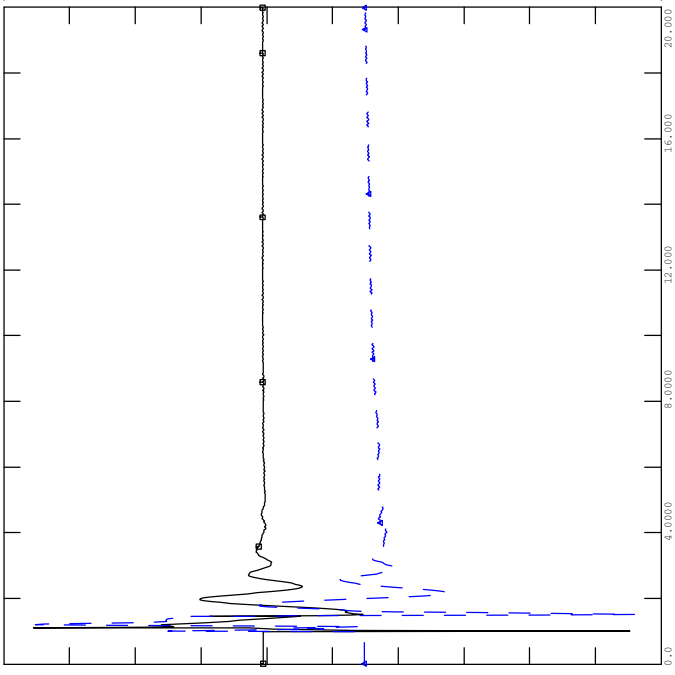
FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-6.276 -16.33

CHNL# 43: [POWR 669 TO 1012 CKT '35']
285.12 230.30



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

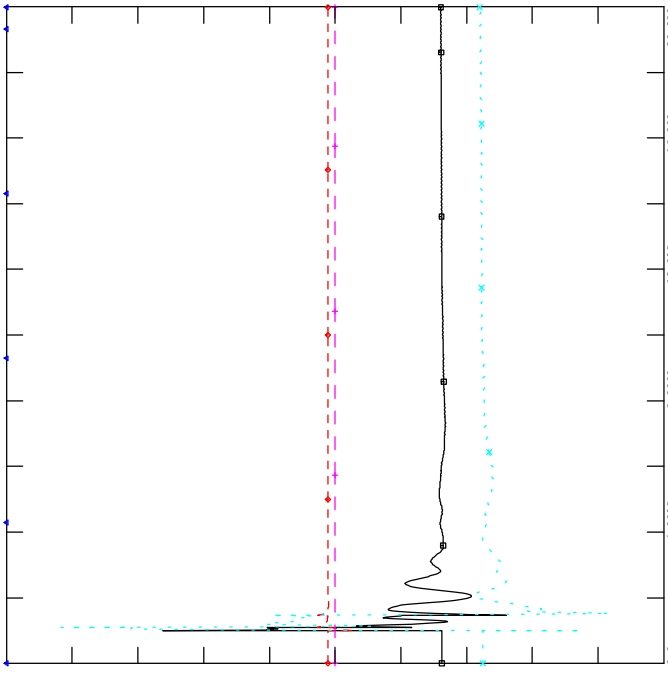
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2734 0.67060

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.08520 -0.0208

CHNL# 11: [VARS 773[SECST 20.000]1]
0.21390 -0.2459

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.35300 0.14160



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN3_SP_24_658L_BOWMANTON

FILE: Scn3_SP_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-9.423 -23.17

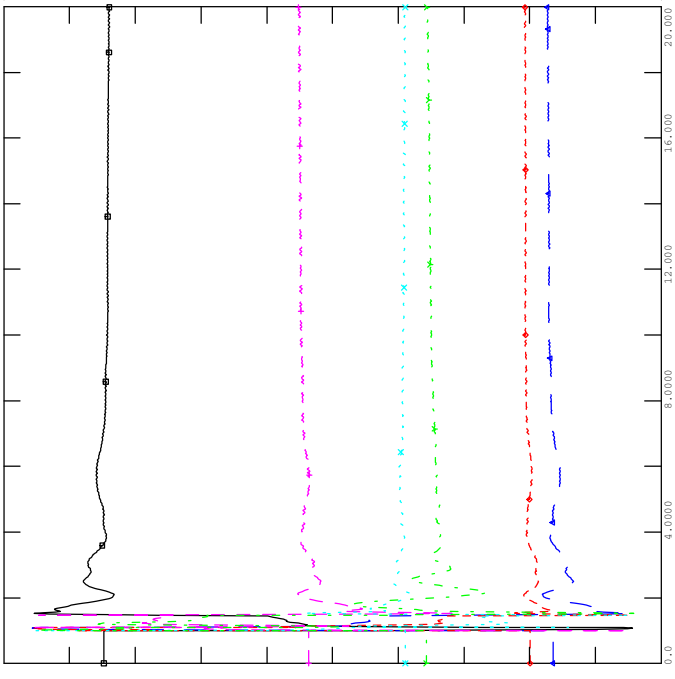
CHNL# 40: [VARS 669 TO 547004 CKT '74']
0.10410 -42.02

CHNL# 38: [VARS 662 TO 720 CKT '64']
11.800 3.9148

CHNL# 36: [VARS 669 TO 720 CKT '64']
27.321 6.1637

CHNL# 34: [VARS 477 TO 662 CKT '83']
47.274 23.948

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-0.6620 -27.07



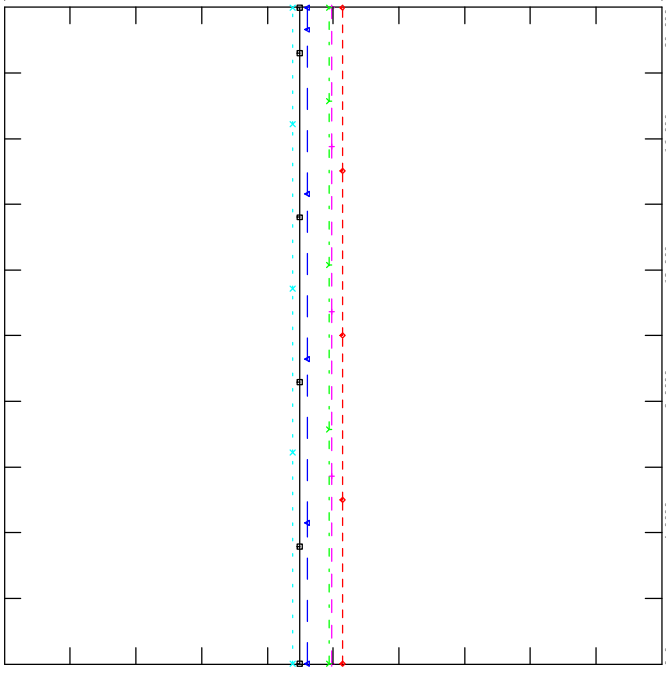
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0210 1.0190
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0564 1.0544
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0548 1.0528
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0572 1.0552
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0272 1.0252
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0224 1.0204



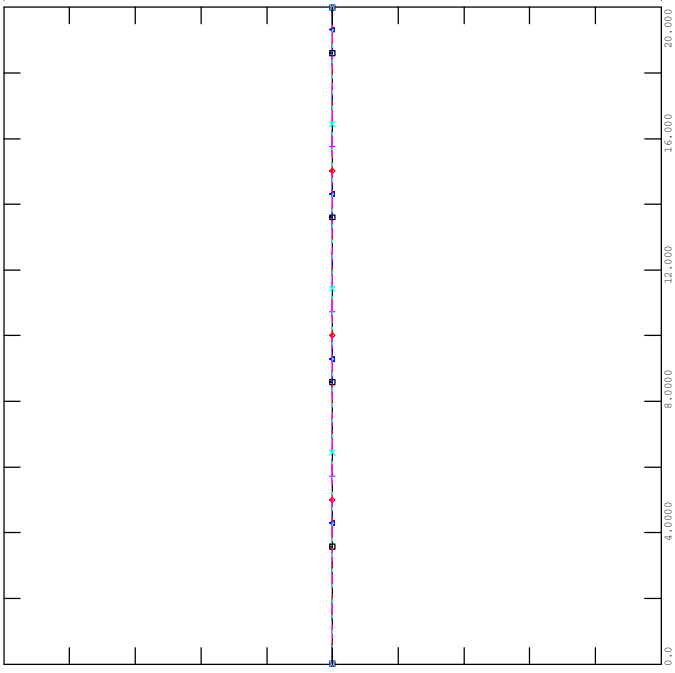
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.0660 1.9660
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.0660 1.9660
CHNL# 6: [POWR 773[SECST 20.000]1] 0.64800 0.54800
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.23700 0.13700



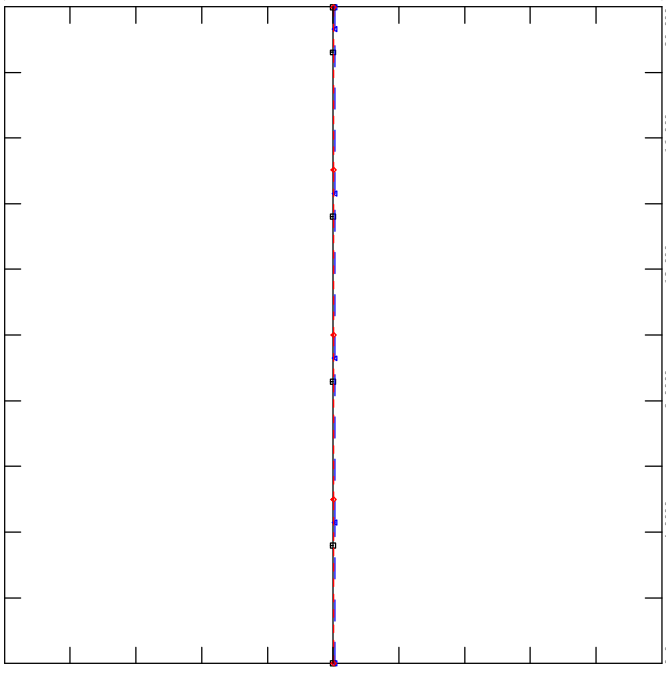
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0410 1.0390
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.84100 0.74100
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.0660 1.9660



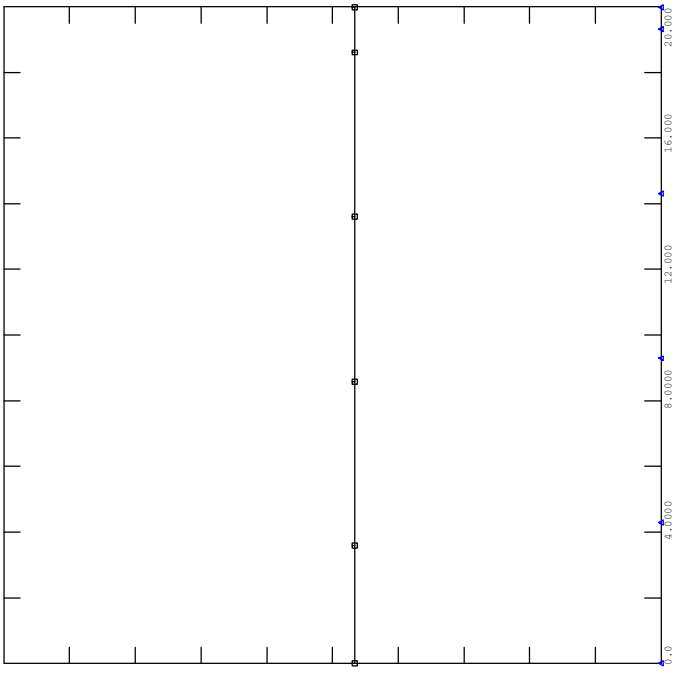
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -38.88 -39.88
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -6.212 -7.212



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 268.59 268.49
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -348.5 -348.6
CHNL# 37: [POWR 662 TO 720 CKT '64'] 43.093 42.993
CHNL# 35: [POWR 669 TO 720 CKT '64'] -235.3 -235.4
CHNL# 33: [POWR 477 TO 662 CKT '83'] -152.7 -152.8
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 152.84 152.74

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] -7.331 -7.431
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 288.63 288.53

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.84100 0.74100
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.13840 0.03840
CHNL# 11: [VARS 773[SECST 20.000]1] -0.1187 -0.2187
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.12400 0.02400

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_00_NOFAULT

FILE: Scn4_SL_00_NoFault.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] -13.95 -14.05
CHNL# 40: [VARS 669 TO 547004 CKT '74'] -3.089 -3.189
CHNL# 38: [VARS 662 TO 720 CKT '64'] -0.6254 -0.7256
CHNL# 36: [VARS 669 TO 720 CKT '64'] 17.060 16.960
CHNL# 34: [VARS 477 TO 662 CKT '83'] 24.231 24.130
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -24.13 -24.23

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

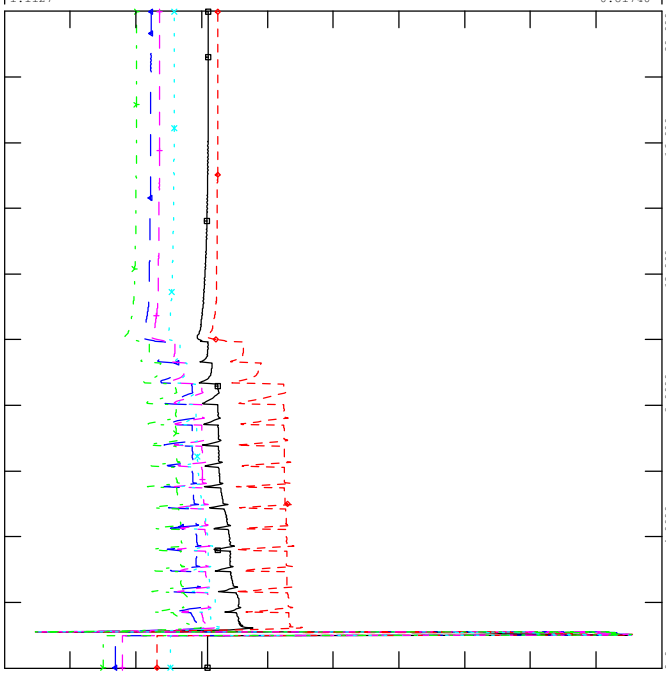
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1204 0.45230
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1562 0.75770
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2280 0.25930
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3811 -0.0181
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1647 0.34260
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1127 0.81740



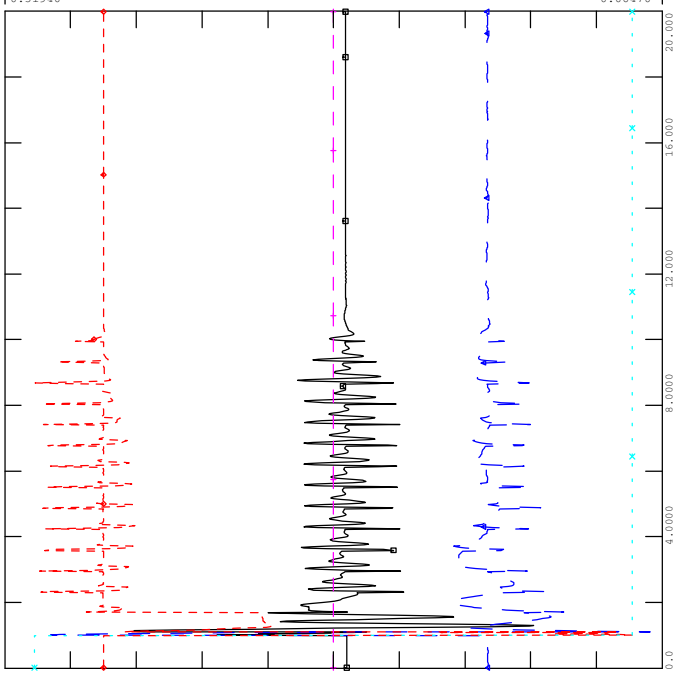
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1168 -0.1008
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3270 0.25270
CHNL# 6: [POWR 773[SECST 20.000]1] 0.94290 0.47350
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.31940 0.06470



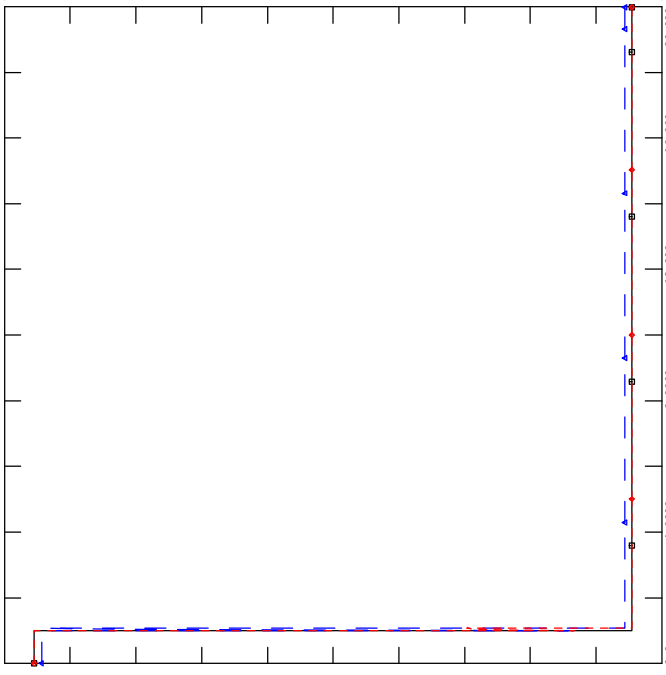
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0920 -0.0520
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.84100 -0.0500
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1168 -0.1008



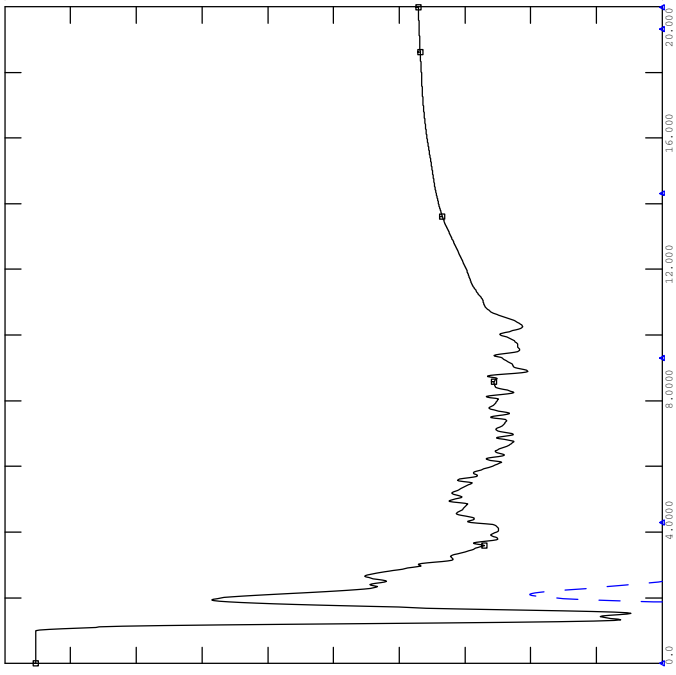
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.58 -42.51
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -5.902 -23.74



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
282.24 -19.29

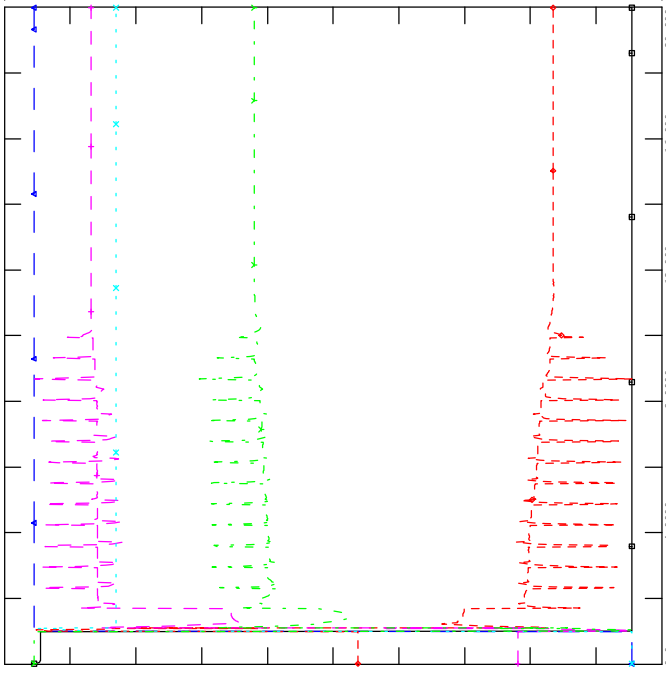
CHNL# 39: [POWR 669 TO 547004 CKT '74']
75.349 -368.7

CHNL# 37: [POWR 662 TO 720 CKT '64']
225.31 -8.156

CHNL# 35: [POWR 669 TO 720 CKT '64']
23.722 -458.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
7.6394 -160.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
16212. -772.0



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

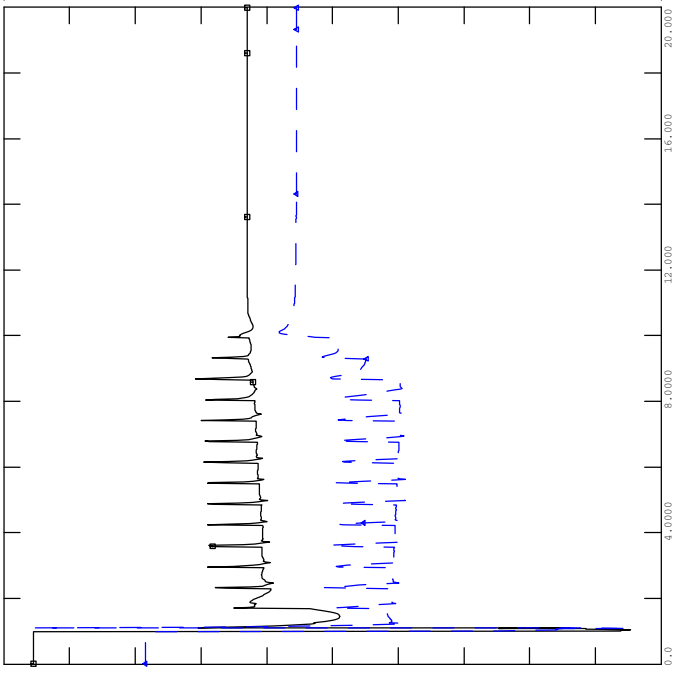
FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
57.771 -245.3

CHNL# 43: [POWR 669 TO 1012 CKT '35']
302.92 -12.39



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

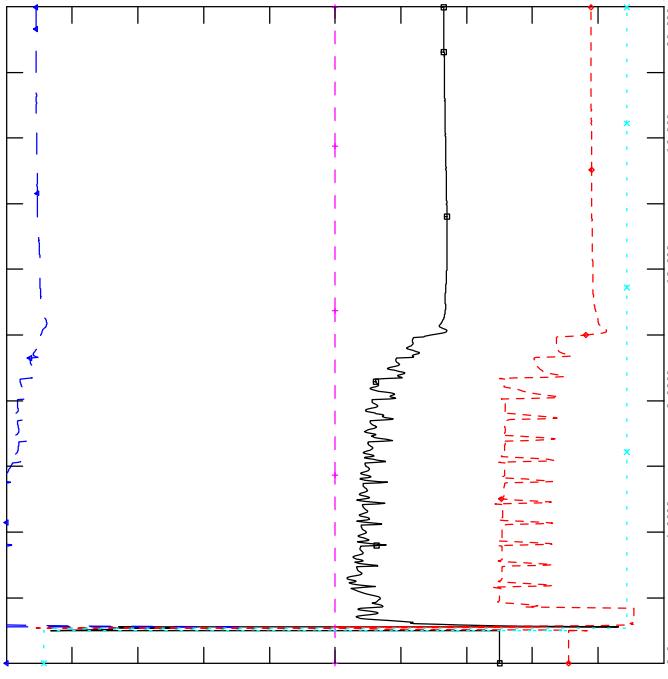
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
0.84100 -0.0500

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.3418 -0.2930

CHNL# 11: [VARS 773[SECST 20.000]1]
0.46730 -0.5561

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.63210 -0.1118



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_01_1074L_ELKWATER

FILE: Scn4_SL_01_1074L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
49.711 -246.1

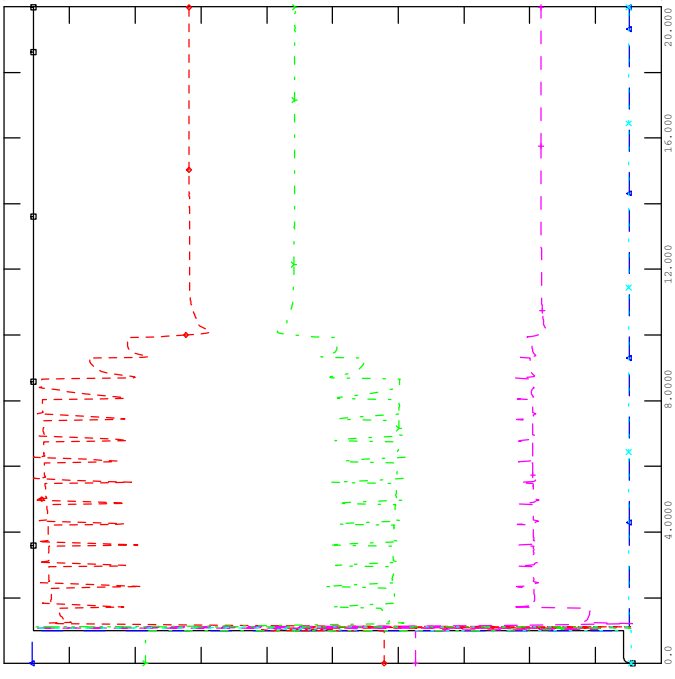
CHNL# 40: [VARS 669 TO 547004 CKT '74']
746.50 -38.86

CHNL# 38: [VARS 662 TO 720 CKT '64']
173.05 -104.2

CHNL# 36: [VARS 669 TO 720 CKT '64']
330.26 -211.0

CHNL# 34: [VARS 477 TO 662 CKT '83']
25.393 -1.286

CHNL# 32: [VARS 477 TO 547004 CKT '74']
119.70 -2514.



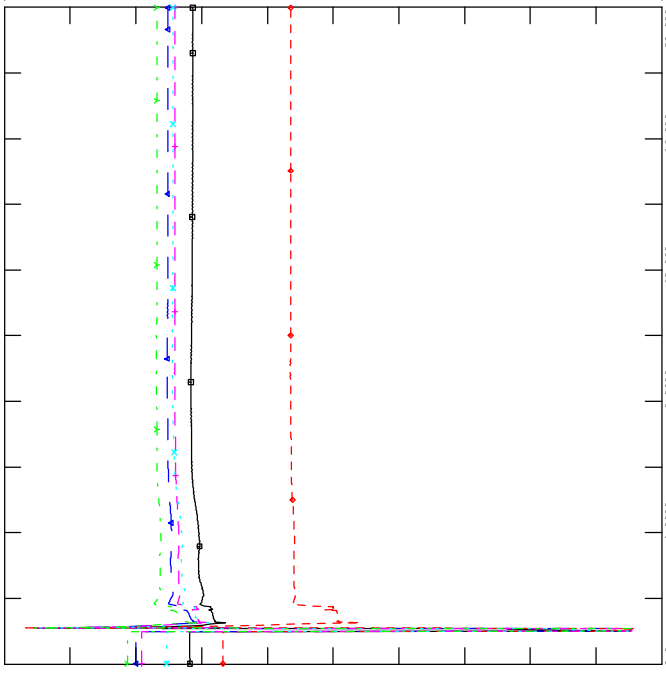
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.2068 0.20990
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1950 0.62890
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3479 -0.0592
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.5911 -0.0202
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2678 0.06090
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1361 0.72990



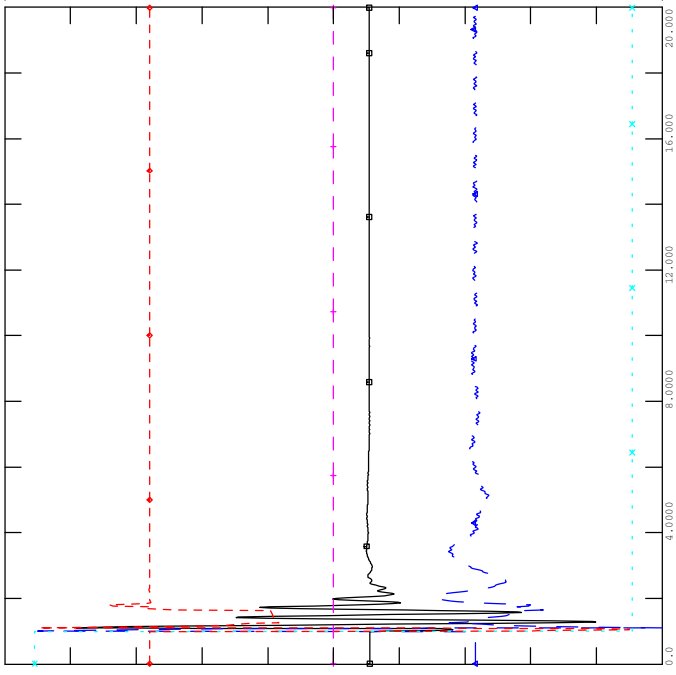
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1169 -0.1008
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5982 -0.0455
CHNL# 6: [POWR 773[SECST 20.000]1] 0.99940 0.43860
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.46180 -0.0332



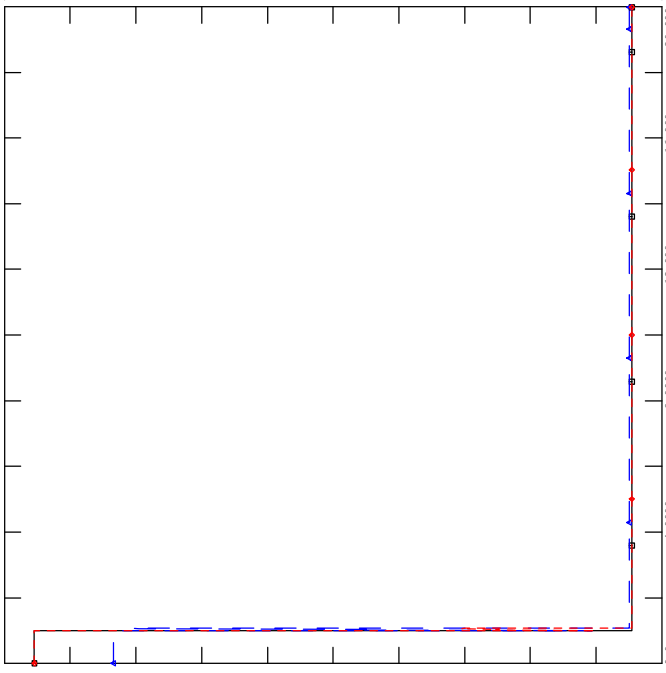
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0921 -0.0520
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 0.95810 -0.0500
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1169 -0.1008



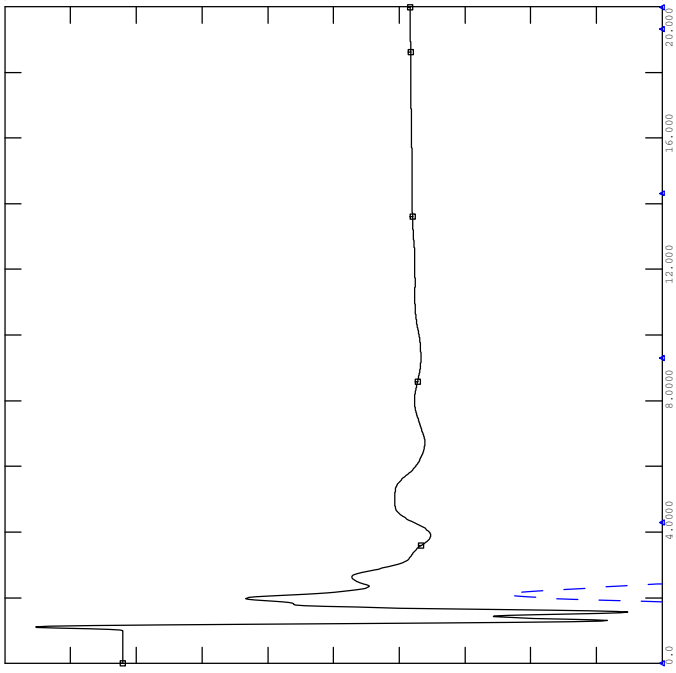
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.08 -42.27
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -2.201 -27.57



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
282.01 -13.89

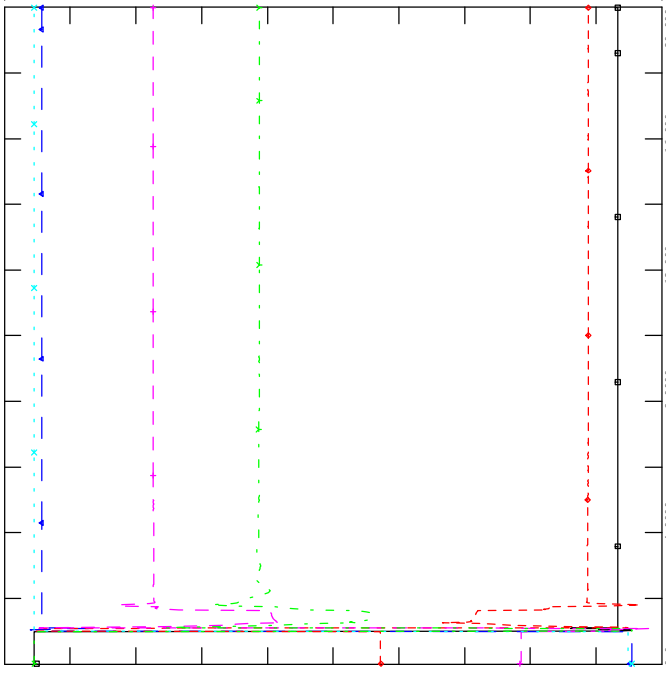
CHNL# 39: [POWR 669 TO 547004 CKT '74']
1754.7 -36848

CHNL# 37: [POWR 662 TO 720 CKT '64']
255.37 -14.84

CHNL# 35: [POWR 669 TO 720 CKT '64']
21.182 -427.8

CHNL# 33: [POWR 477 TO 662 CKT '83']
9.6134 -160.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
160.61 -11.51



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

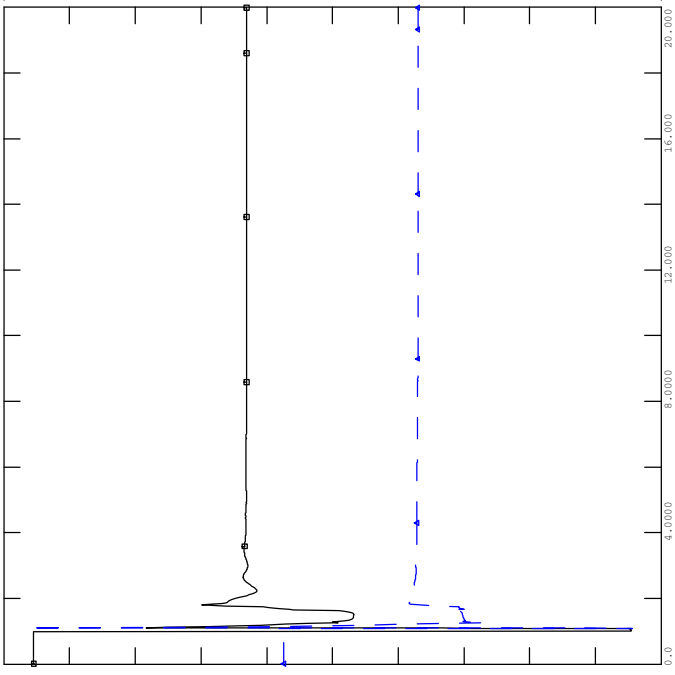
FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
165.65 -241.3

CHNL# 43: [POWR 669 TO 1012 CKT '35']
303.05 -14.78



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

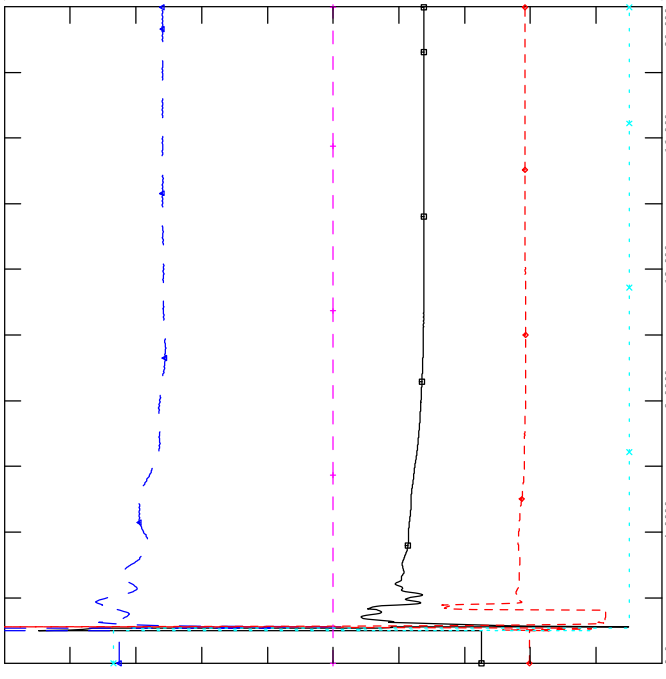
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
0.95810 -0.0500

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.8333 -0.3530

CHNL# 11: [VARS 773[SECST 20.000]1]
0.75320 -0.5961

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.77430 -0.1907



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_02_1074L_BOWMANTON

FILE: Scn4_SL_02_1074L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
157.77 -242.3

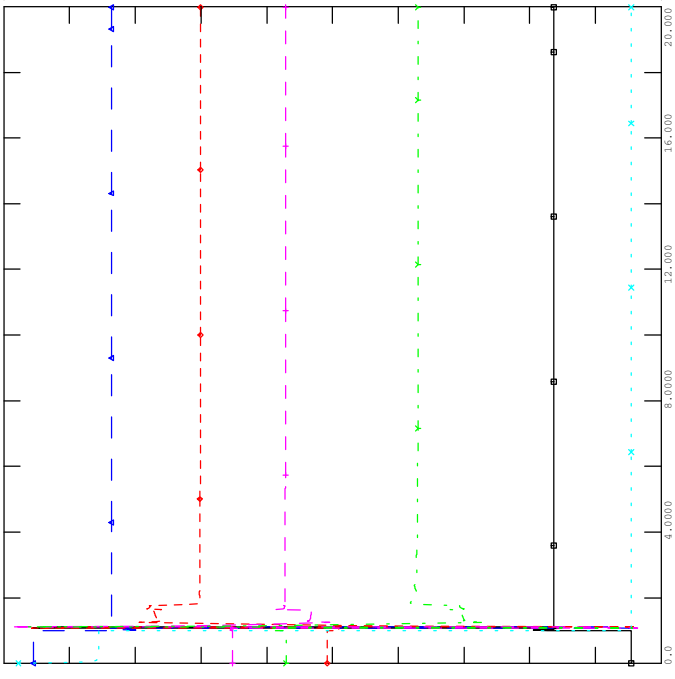
CHNL# 40: [VARS 669 TO 547004 CKT '74']
322.07 -15.34

CHNL# 38: [VARS 662 TO 720 CKT '64']
212.79 -400.1

CHNL# 36: [VARS 669 TO 720 CKT '64']
513.64 -495.6

CHNL# 34: [VARS 477 TO 662 CKT '83']
33.505 -171.1

CHNL# 32: [VARS 477 TO 547004 CKT '74']
171.06 -33.50



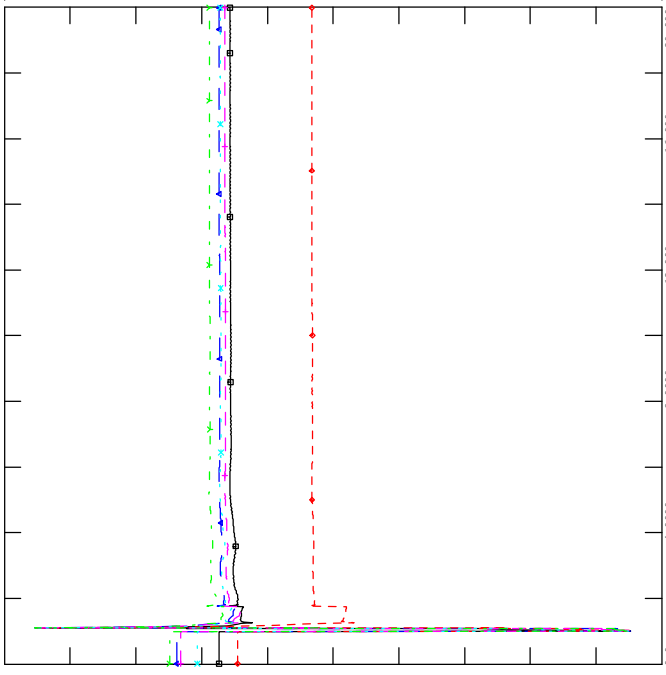
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.2113 0.45030
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1793 0.75780
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3463 0.25660
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.6517 -0.0279
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2697 0.34050
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1201 0.81780



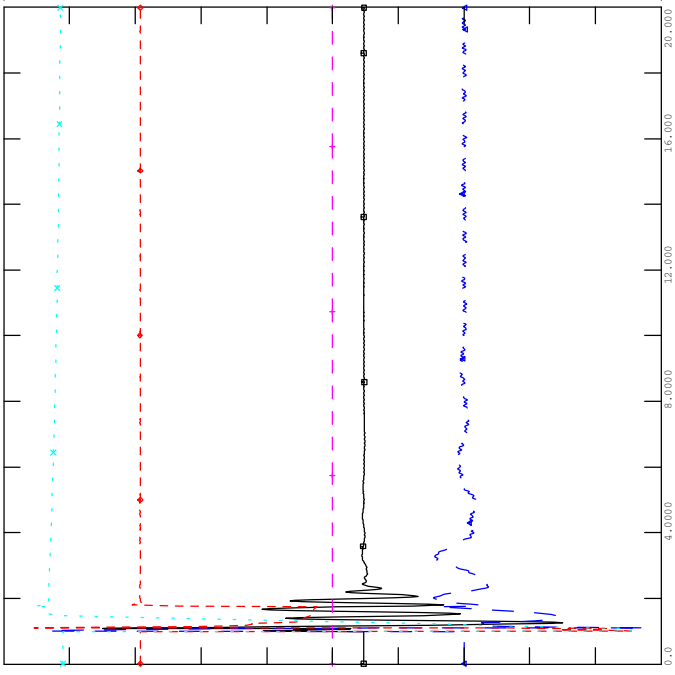
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2260 -0.1060
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.4794 0.24410
CHNL# 6: [POWR 773[SECST 20.000]1] 0.94230 0.45060
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.36910 0.03660



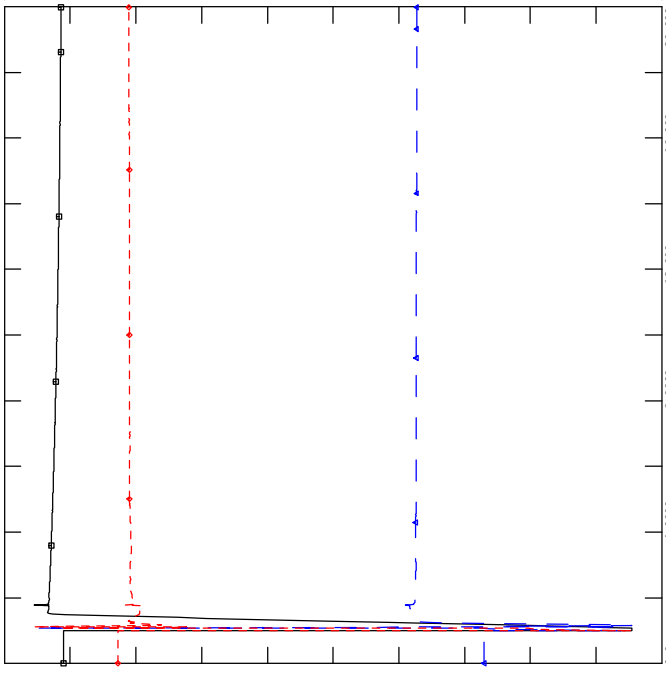
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2461 0.05000
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 3.2859 -0.1341
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2260 -0.1060



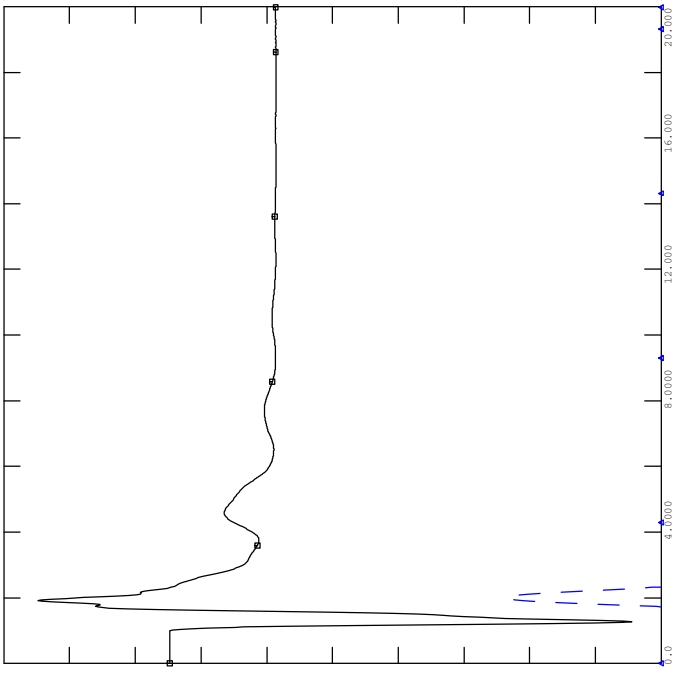
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.04 -42.35
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -1.428 -22.53



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
293.44 -21.11

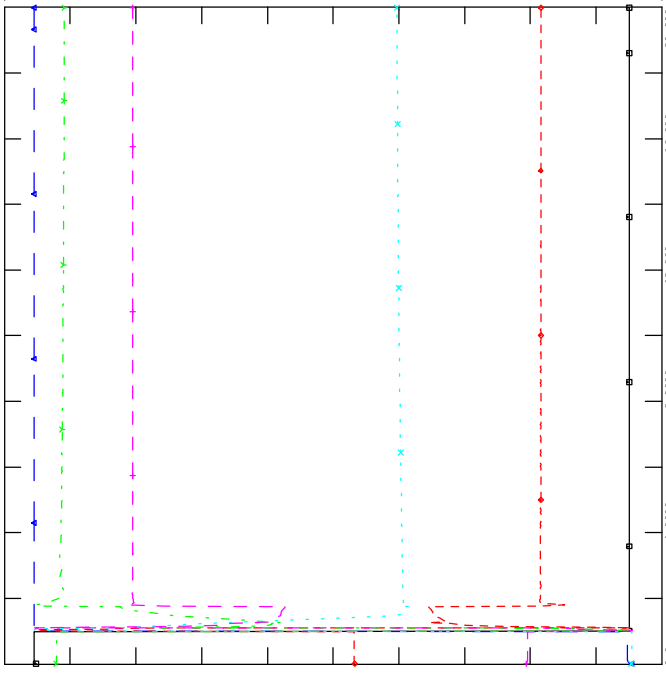
CHNL# 39: [POWR 669 TO 547004 CKT '74']
55.200 -367.7

CHNL# 37: [POWR 662 TO 720 CKT '64']
242.49 -8.290

CHNL# 35: [POWR 669 TO 720 CKT '64']
27.187 -466.7

CHNL# 33: [POWR 477 TO 662 CKT '83']
769.75 -16165

CHNL# 31: [POWR 477 TO 547004 CKT '74']
160.46 -8.317



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

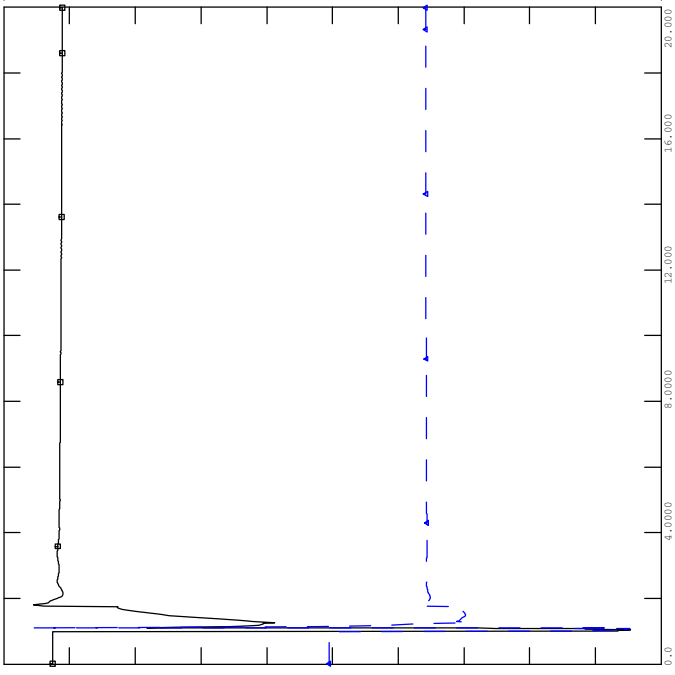
FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
202.65 -222.2

CHNL# 43: [POWR 669 TO 1012 CKT '35']
312.78 -14.10



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

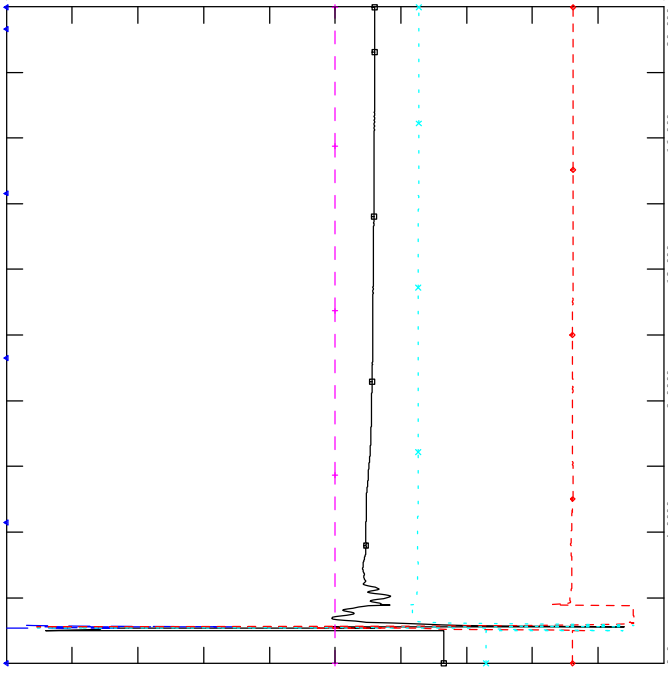
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
3.2859 -0.1341

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
3.3659 -0.4394

CHNL# 11: [VARS 773[SECST 20.000]1]
0.46470 -0.5279

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.63060 -0.2068



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_03_983L_ELKWATER

FILE: Scn4_SL_03_983L_Elkwater.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
193.21 -221.4

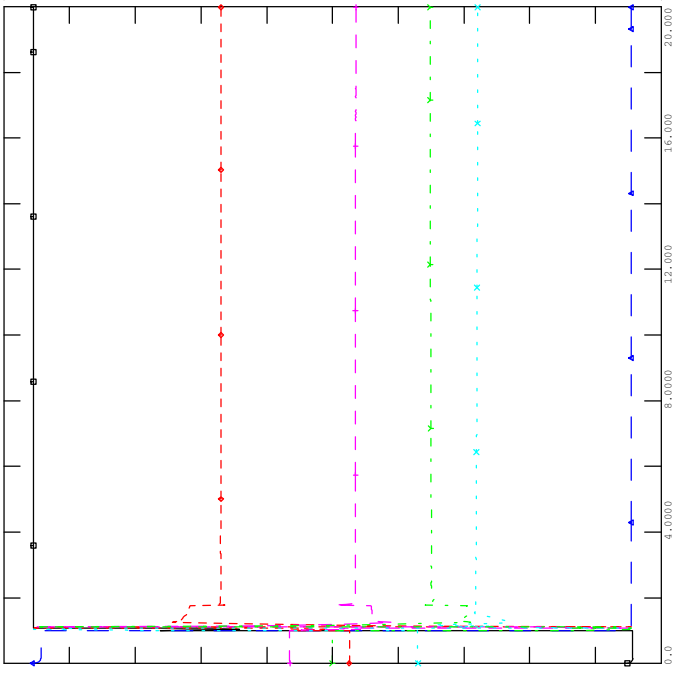
CHNL# 40: [VARS 669 TO 547004 CKT '74']
454.71 -272.5

CHNL# 38: [VARS 662 TO 720 CKT '64']
306.56 -399.8

CHNL# 36: [VARS 669 TO 720 CKT '64']
623.74 -530.4

CHNL# 34: [VARS 477 TO 662 CKT '83']
3592.5 -171.1

CHNL# 32: [VARS 477 TO 547004 CKT '74']
1.2091 -25.39



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]]
1.1082 0.55370

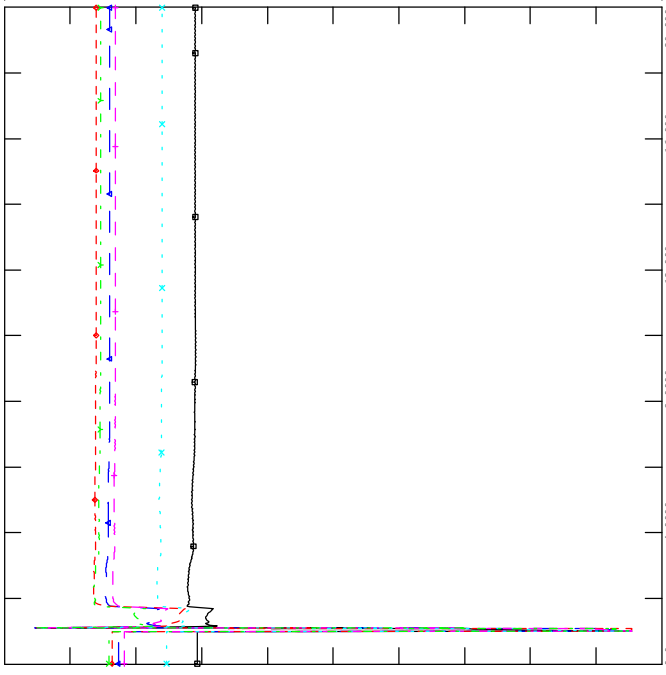
CHNL# 26: [VOLT 918 [CASS01 240.00]]
1.1351 0.81210

CHNL# 25: [VOLT 669 [BOWMAN1 240.00]]
1.2008 0.39580

CHNL# 24: [VOLT 662 [WHITLA1 240.00]]
1.2740 -0.0589

CHNL# 23: [VOLT 659 [BOWMAN2 138.00]]
1.1453 0.45930

CHNL# 22: [VOLT 645 [BOWMAN3 138.00]]
1.0907 0.85470



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

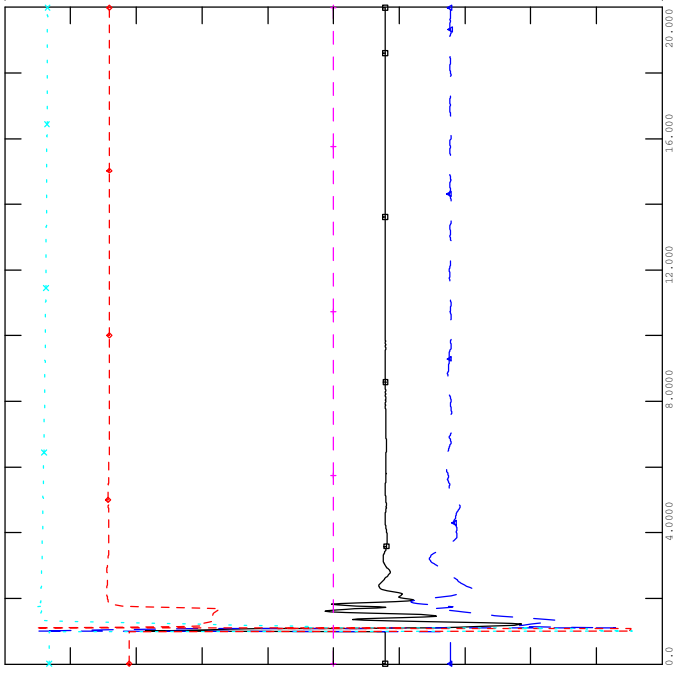
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.1687 -0.1033

CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1]
2.4209 0.28110

CHNL# 6: [POWR 773[SECST 20.000]1]
0.93240 0.43880

CHNL# 5: [POWR 713[CMH 14 13.800]14]
0.32220 0.08860



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

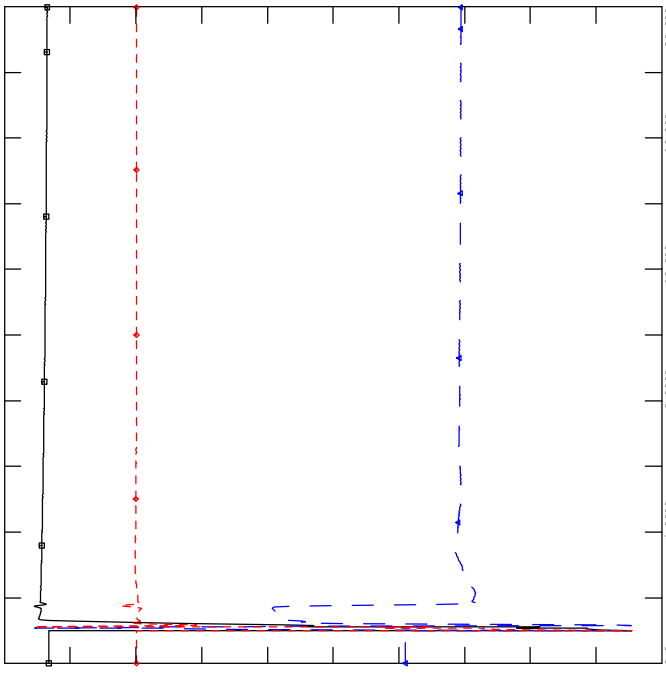
FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1]
1.2290 0.28980

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.7650 0.16760

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.1687 -0.1033



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

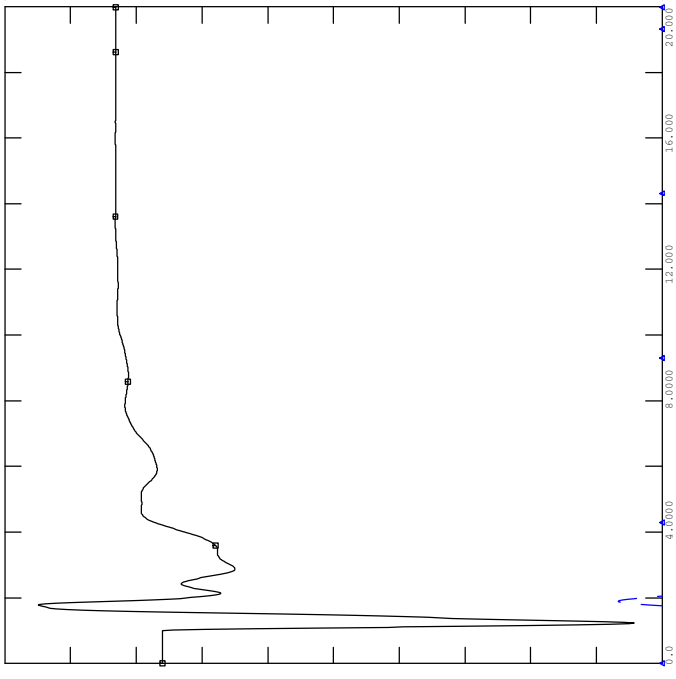
FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1]
-36.68 -41.94

CHNL# 1: [ANGL 713[CMH 14 13.800]14]
-3.616 -16.66



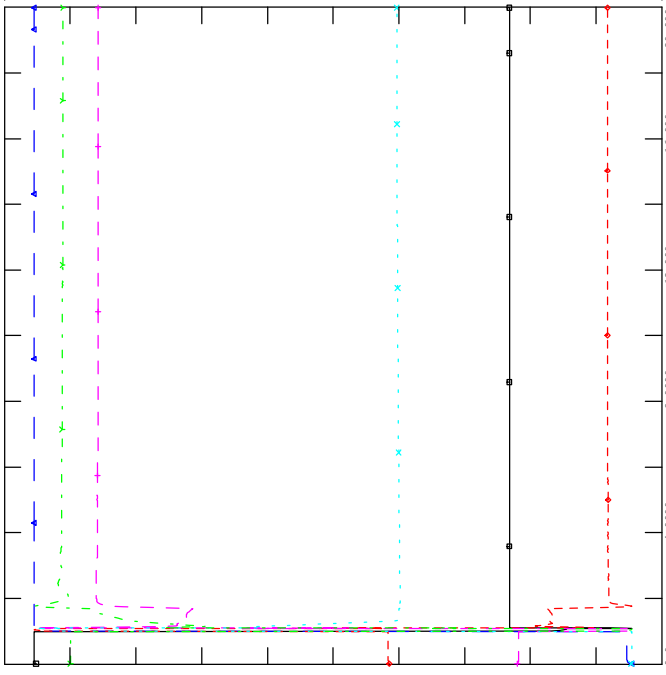
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 300.63 -17.22
CHNL# 39: [POWR 669 TO 547004 CKT '74'] 53.066 -367.6
CHNL# 37: [POWR 662 TO 720 CKT '64'] 238.63 -11.49
CHNL# 35: [POWR 669 TO 720 CKT '64'] 42.369 -433.4
CHNL# 33: [POWR 477 TO 662 CKT '83'] 7.7831 -163.4
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 162.40 -49.08



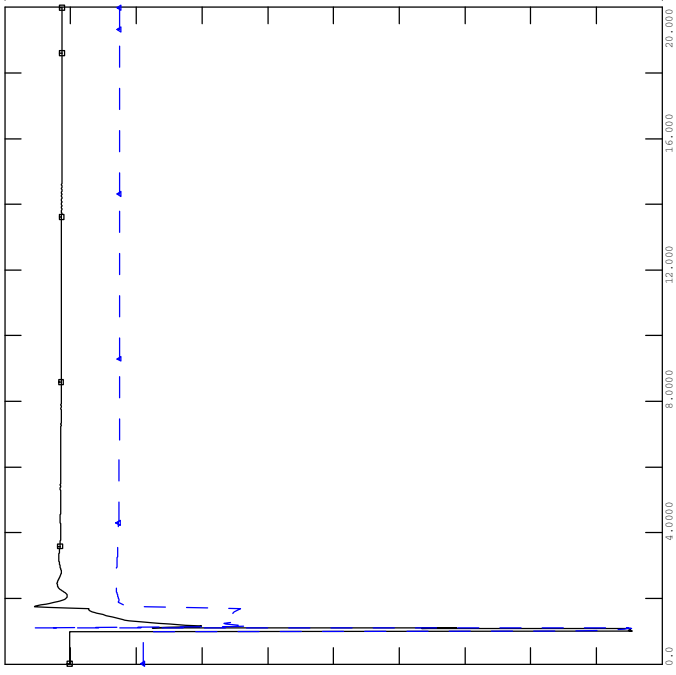
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 57.016 -249.4
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 321.18 -8.851



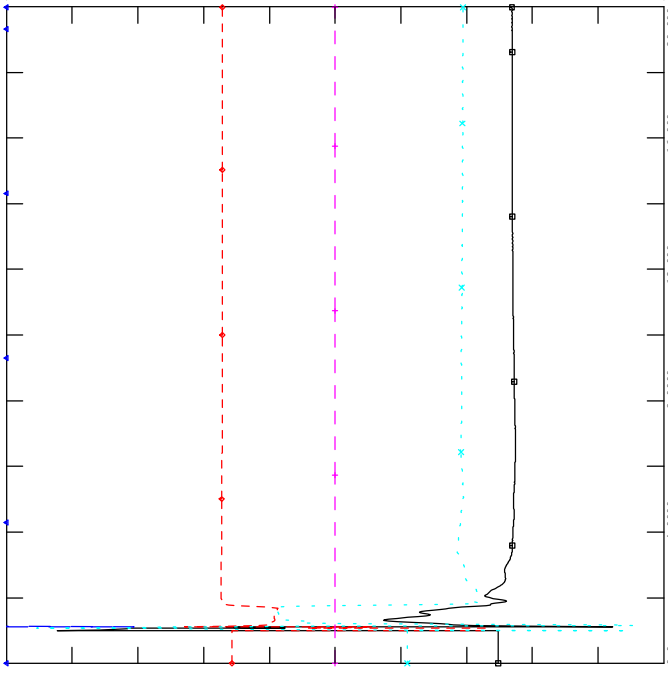
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7650 0.16760
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.15190 -0.0334
CHNL# 11: [VARS 773[SECST 20.000]1] 0.35070 -0.4472
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.56160 -0.0901



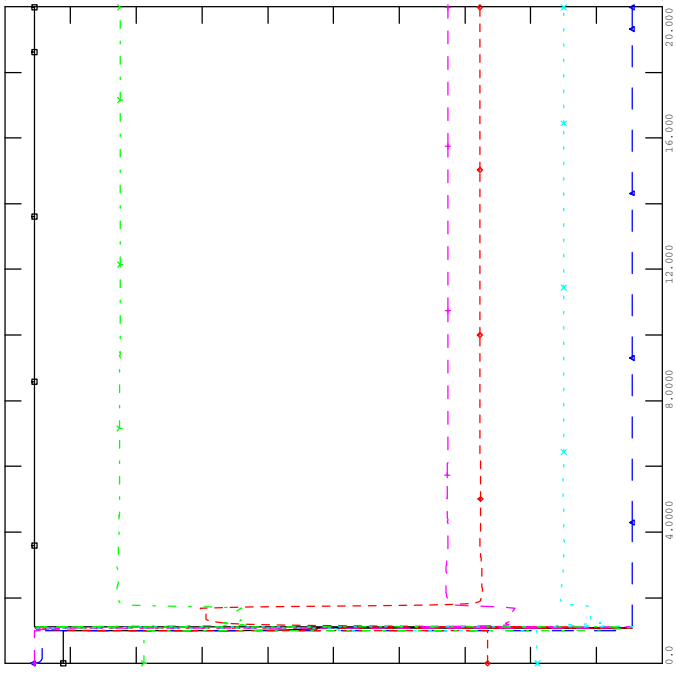
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_04_983L_WHITLA

FILE: Scn4_SL_04_983L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 49.206 -250.1
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 651.66 -157.1
CHNL# 38: [VARS 662 TO 720 CKT '64'] 1.7090 -50.67
CHNL# 36: [VARS 669 TO 720 CKT '64'] 326.07 -94.59
CHNL# 34: [VARS 477 TO 662 CKT '83'] 26.236 -1.249
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 25.160 -528.4



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]]
1.0637 0.55590

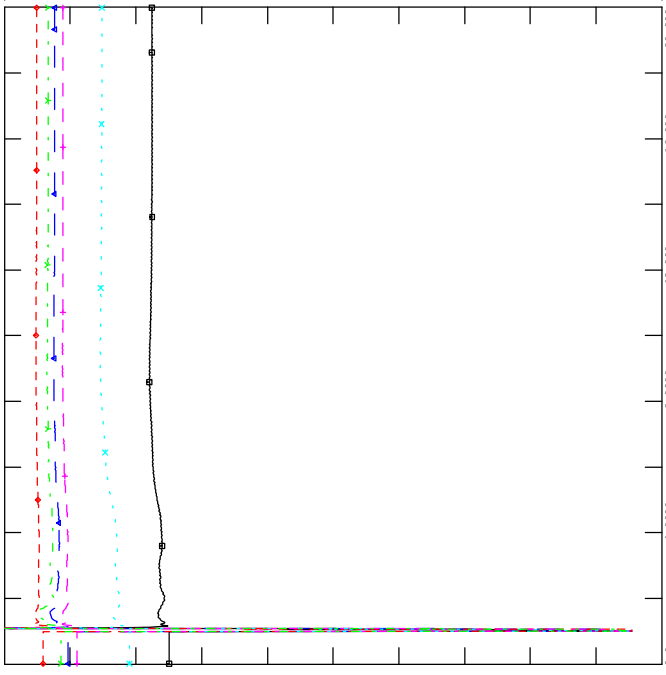
CHNL# 26: [VOLT 918 [CASS01 240.00]]
1.1124 0.81320

CHNL# 25: [VOLT 669 [BOWMAN1 240.00]]
1.1351 0.39900

CHNL# 24: [VOLT 662 [WHITLA1 240.00]]
1.1254 -0.0532

CHNL# 23: [VOLT 659 [BOWMAN2 138.00]]
1.0868 0.46220

CHNL# 22: [VOLT 645 [BOWMAN3 138.00]]
1.0769 0.85540



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

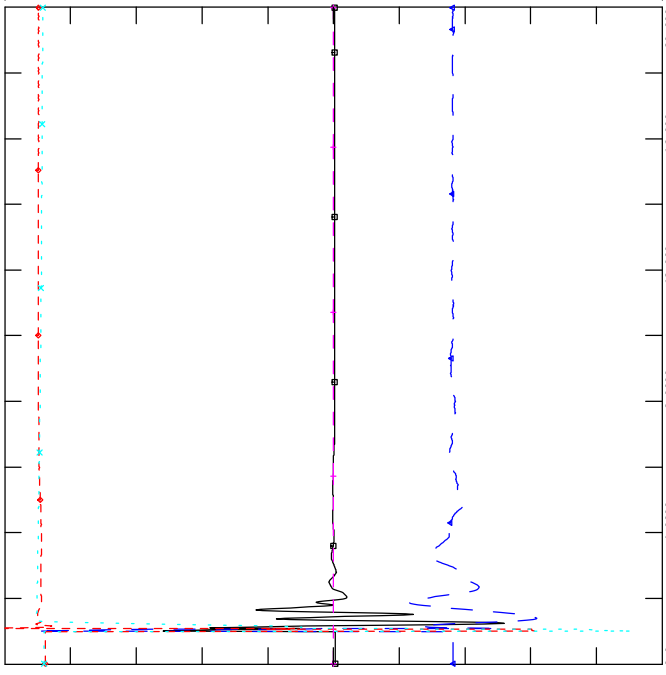
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.1499 -0.1024

CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1]
2.1528 -0.0521

CHNL# 6: [POWR 773[SECST 20.000]1]
0.93250 0.44190

CHNL# 5: [POWR 713[CMH 14 13.800]14]
0.35080 0.02500



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

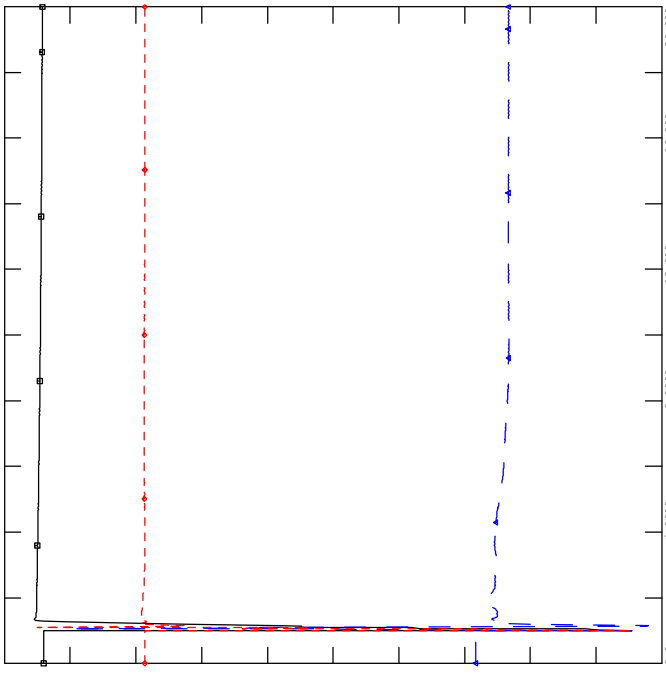
FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1]
1.2433 0.29030

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.4083 0.15140

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.1499 -0.1024



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

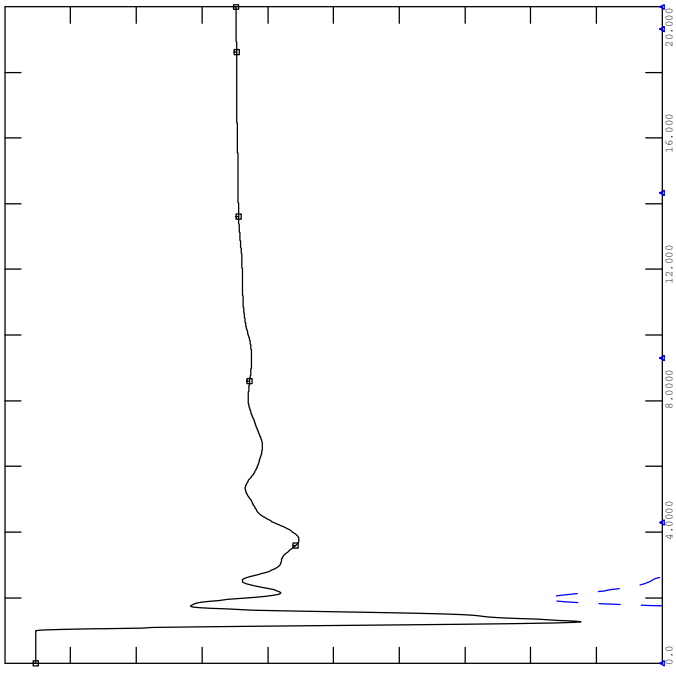
FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1]
-36.76 -42.92

CHNL# 1: [ANGL 713[CMH 14 13.800]14]
-5.787 -26.13



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
282.14 -16.95

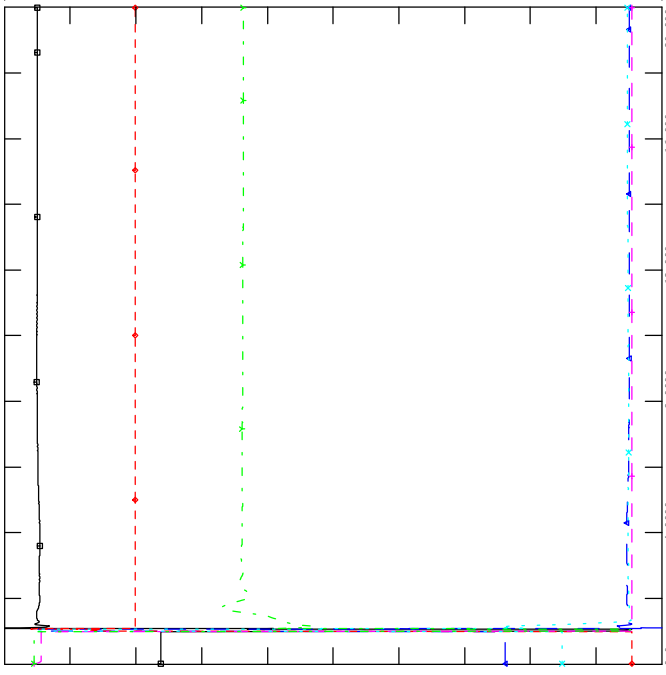
CHNL# 39: [POWR 669 TO 547004 CKT '74']
37.795 -417.5

CHNL# 37: [POWR 662 TO 720 CKT '64']
4573.3 -217.8

CHNL# 35: [POWR 669 TO 720 CKT '64']
61.809 -249.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
29.168 -209.6

CHNL# 31: [POWR 477 TO 547004 CKT '74']
209.65 -29.17



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

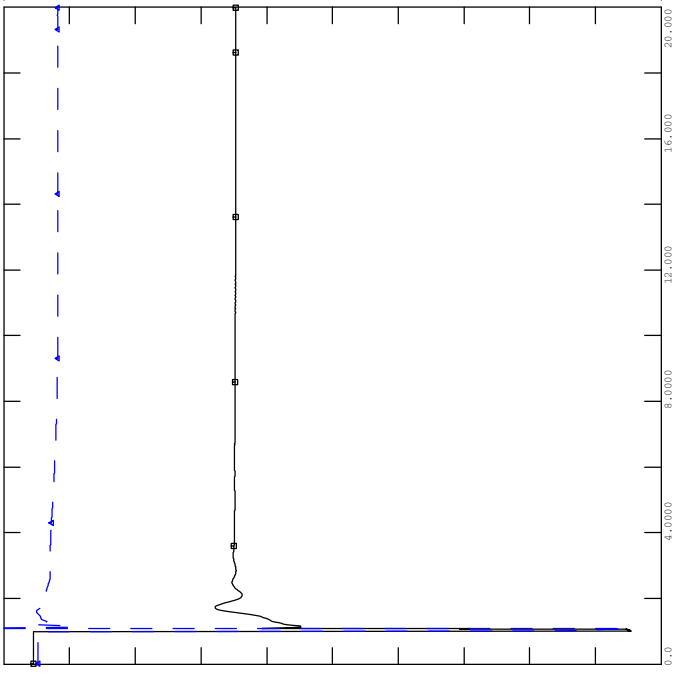
FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
5.8938 -251.5

CHNL# 43: [POWR 669 TO 1012 CKT '35']
302.72 -8.121



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

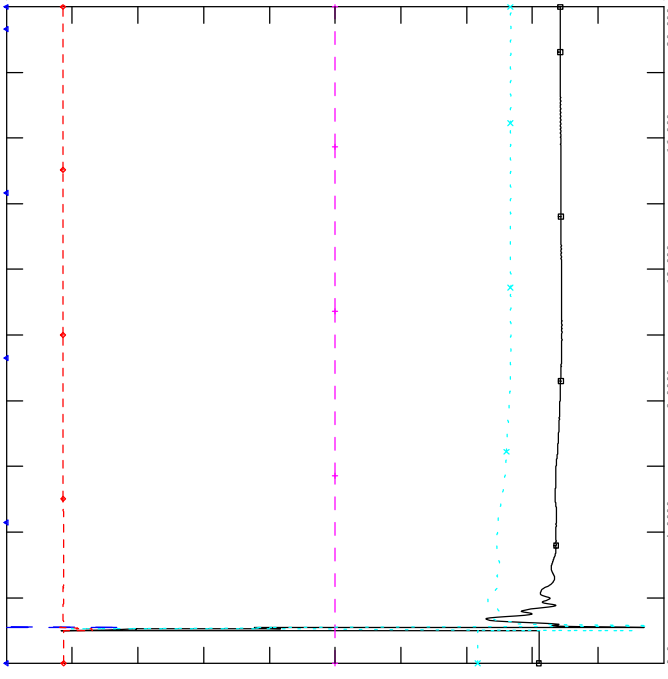
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.4083 0.15140

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.23180 -1.420

CHNL# 11: [VARS 773[SECST 20.000]1]
0.35070 -0.4400

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.56150 -0.0406



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_05_964L_WHITLA

FILE: Scn4_SL_05_964L_Whitla.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
0.26510 -251.1

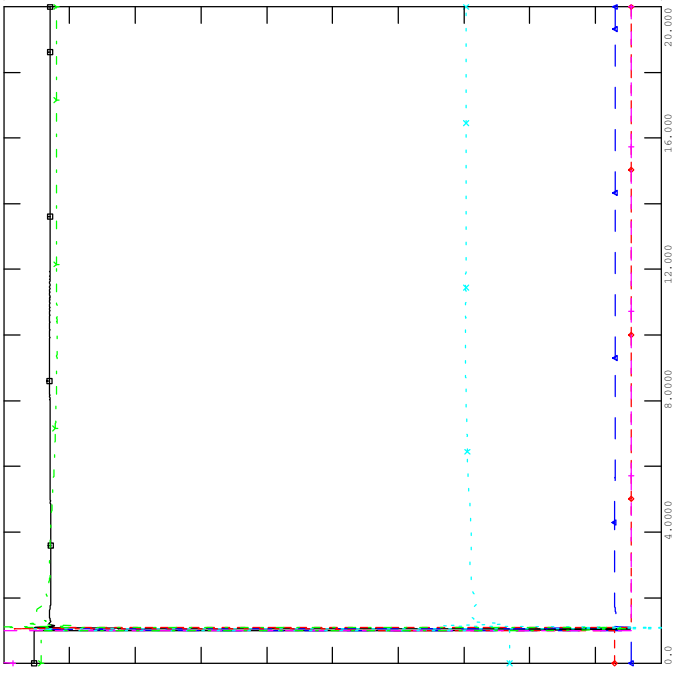
CHNL# 40: [VARS 669 TO 547004 CKT '74']
259.08 -81.63

CHNL# 38: [VARS 662 TO 720 CKT '64']
48.888 -2.328

CHNL# 36: [VARS 669 TO 720 CKT '64']
647.03 -30.81

CHNL# 34: [VARS 477 TO 662 CKT '83']
246.60 13.573

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-13.57 -246.6



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1531 0.22230
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1642 0.63360
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2715 -0.0477
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.4215 -0.0021
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2019 0.07420
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1143 0.73320

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2040 -0.1050
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.4677 0.27180
CHNL# 6: [POWR 773[SECST 20.000]1] 0.99820 0.42300
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.48500 -0.0798

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2315 0.01470
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.7588 -0.2045
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2040 -0.1050

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -35.69 -43.07
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -3.455 -32.70

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
282.07 -15.04

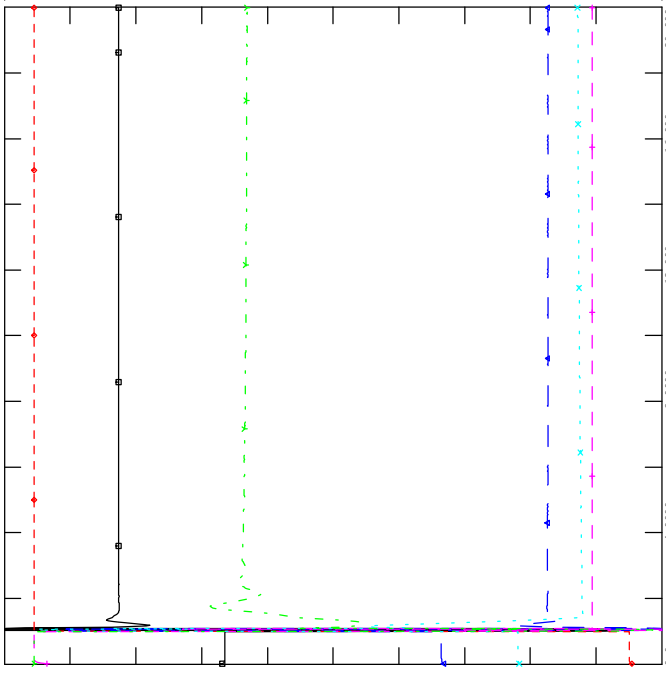
CHNL# 39: [POWR 669 TO 547004 CKT '74']
23.726 -452.6

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.358 -5.373

CHNL# 35: [POWR 669 TO 720 CKT '64']
1182.2 -24825

CHNL# 33: [POWR 477 TO 662 CKT '83']
23.027 -241.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
241.49 -23.38



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

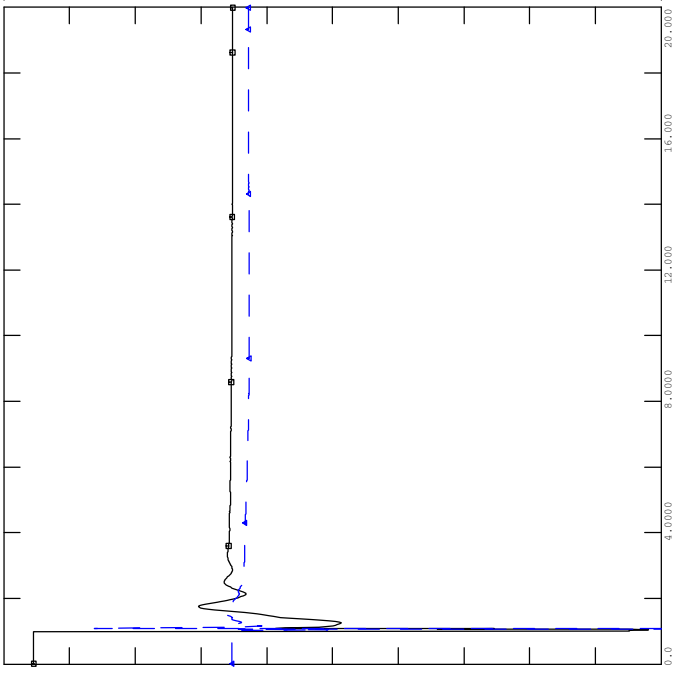
FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
90.117 -190.9

CHNL# 43: [POWR 669 TO 1012 CKT '35']
303.10 -15.69



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

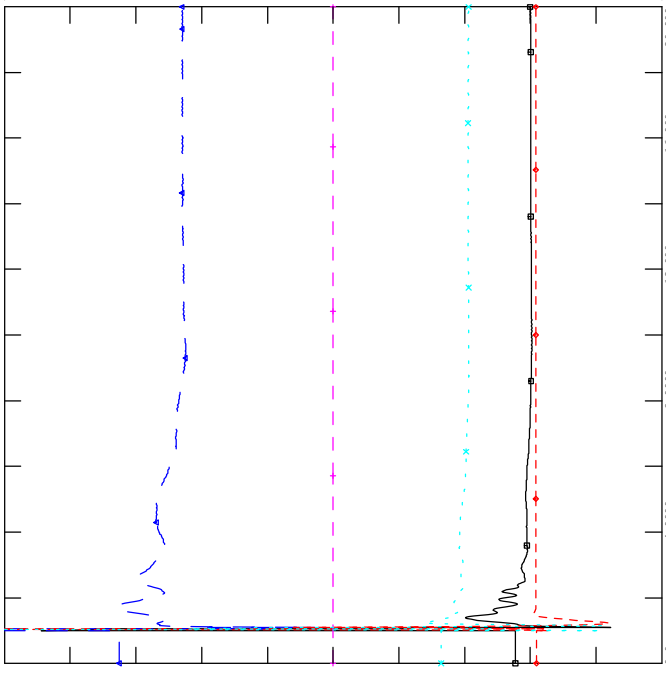
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.7588 -0.2045

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.9709 -0.5924

CHNL# 11: [VARS 773[SECST 20.000]1]
0.74400 -0.5527

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.77110 -0.1260



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_06_964L_BOWMANTON

FILE: Scn4_SL_06_964L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
84.381 -192.4

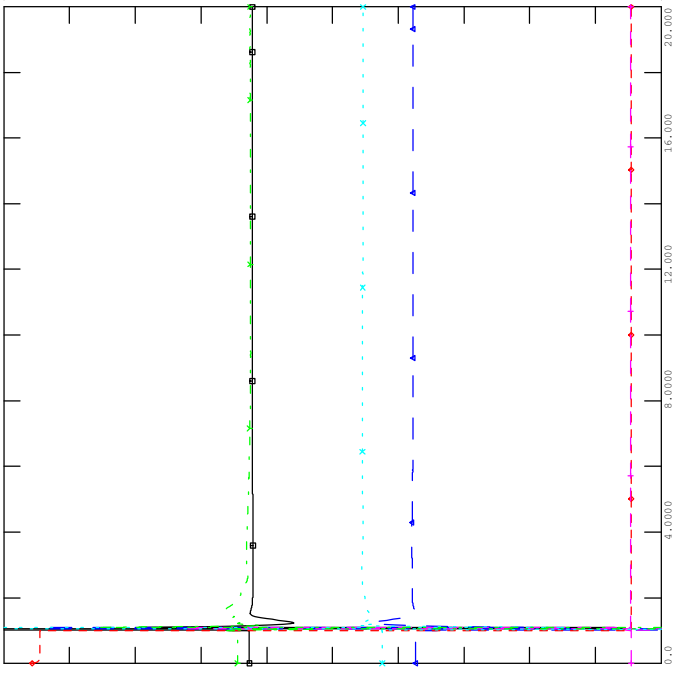
CHNL# 40: [VARS 669 TO 547004 CKT '74']
406.52 -304.5

CHNL# 38: [VARS 662 TO 720 CKT '64']
458.94 -22.56

CHNL# 36: [VARS 669 TO 720 CKT '64']
3366.2 -160.3

CHNL# 34: [VARS 477 TO 662 CKT '83']
540.17 -283.1

CHNL# 32: [VARS 477 TO 547004 CKT '74']
283.15 -540.2



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.2012 0.36220
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.2800 -0.0218
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3297 0.17180
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3957 0.24780
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2573 0.25070
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1612 0.28960

TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2144 -0.1054
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5470 0.53920
CHNL# 6: [POWR 773[SECST 20.000]1] 1.2839 0.13230
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.31070 -0.0626

TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2216 0.28010
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 3.0301 -0.5584
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2144 -0.1054

TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -31.56 -42.47
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 26.479 -8.296

TIME (SECONDS)

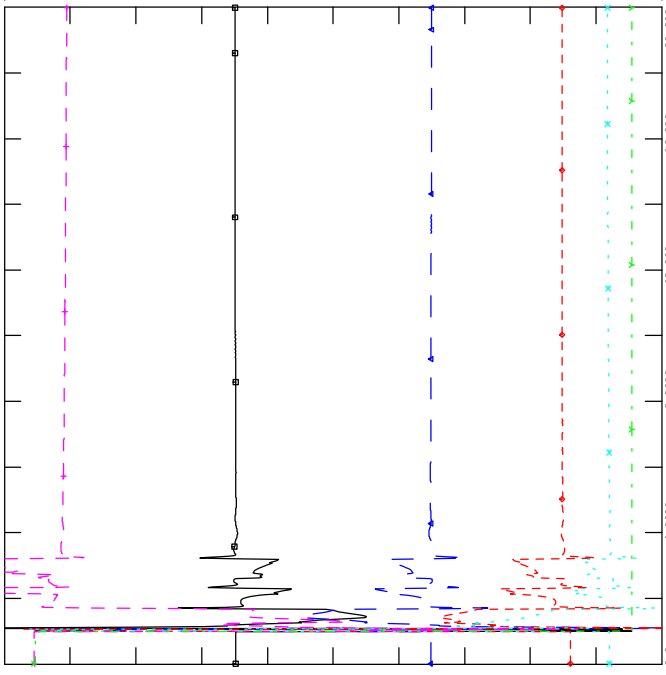
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 285.28 -13.58
CHNL# 39: [POWR 669 TO 547004 CKT '74'] 0.02520 -378.6
CHNL# 37: [POWR 662 TO 720 CKT '64'] 45.608 -10.83
CHNL# 35: [POWR 669 TO 720 CKT '64'] -5.209 -272.5
CHNL# 33: [POWR 477 TO 662 CKT '83'] -7.658 -231.5
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 231.46 7.6584



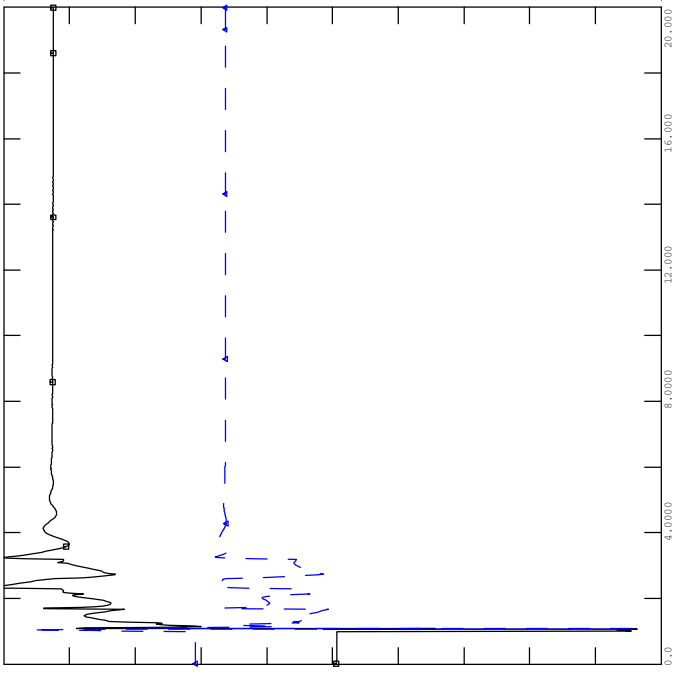
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 130.45 -342.4
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 603.07 -18.27



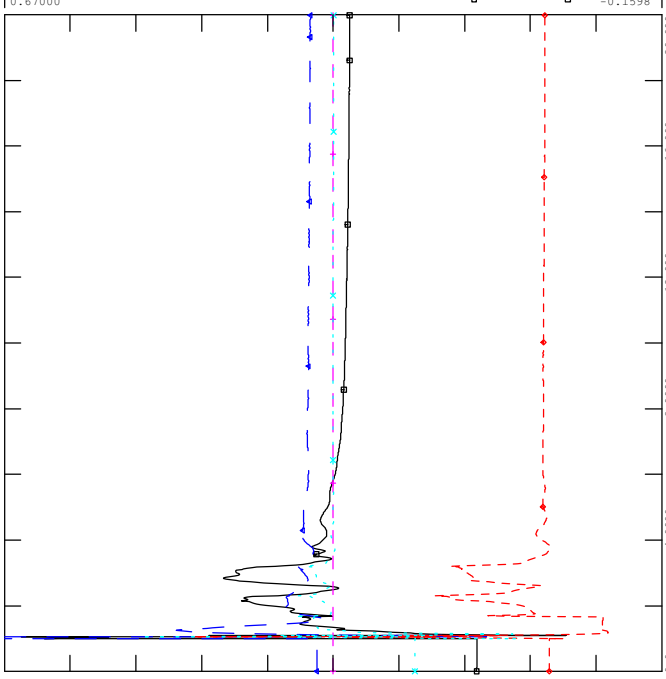
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 3.0301 -0.5584
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 2.2236 -0.3524
CHNL# 11: [VARS 773[SECST 20.000]1] 1.9336 -1.046
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.67000 -0.1598



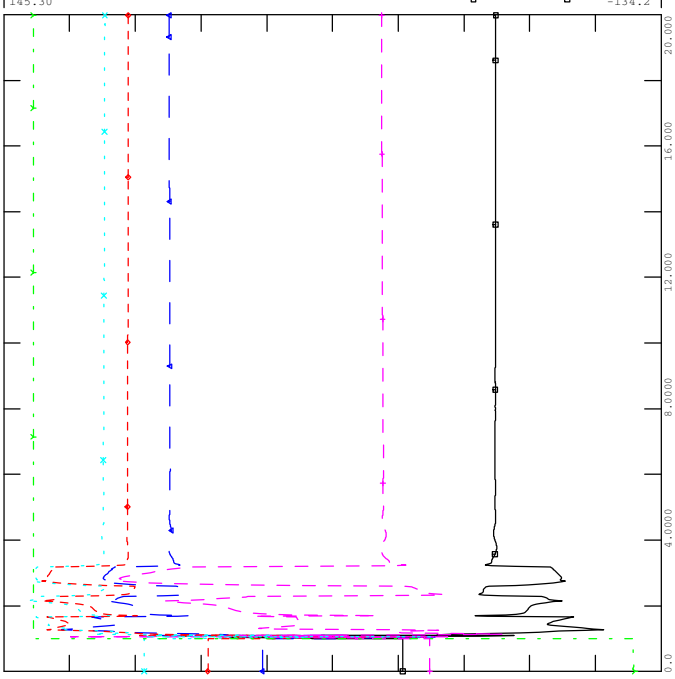
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_07_1034L_CASSILS

FILE: Scn4_SL_07_1034L_Cassils.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 0.69020 -14.49
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 88.882 -341.5
CHNL# 38: [VARS 662 TO 720 CKT '64'] 38.067 -21.66
CHNL# 36: [VARS 669 TO 720 CKT '64'] 123.22 -218.8
CHNL# 34: [VARS 477 TO 662 CKT '83'] 134.17 -145.3
CHNL# 32: [VARS 477 TO 547004 CKT '74'] 145.30 -134.2



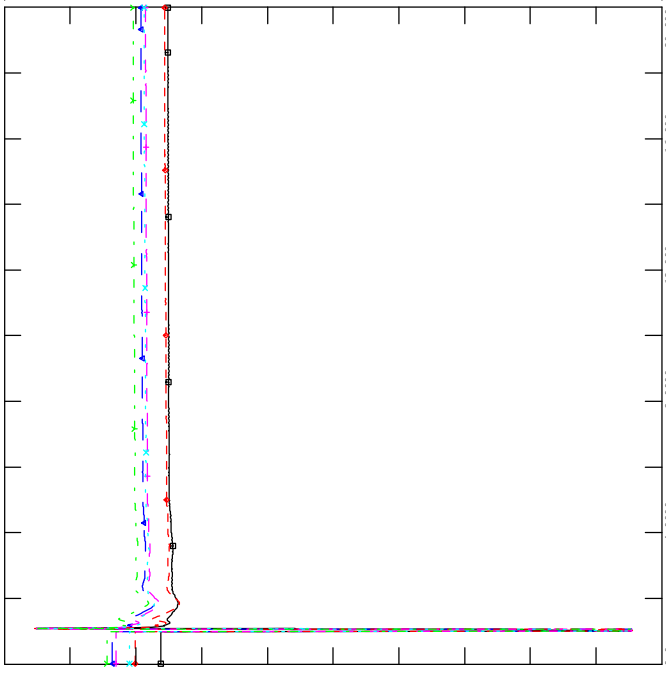
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1679 0.21840
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1554 0.62920
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2794 -0.0521
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3300 -0.0486
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2143 0.06940
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1124 0.73000



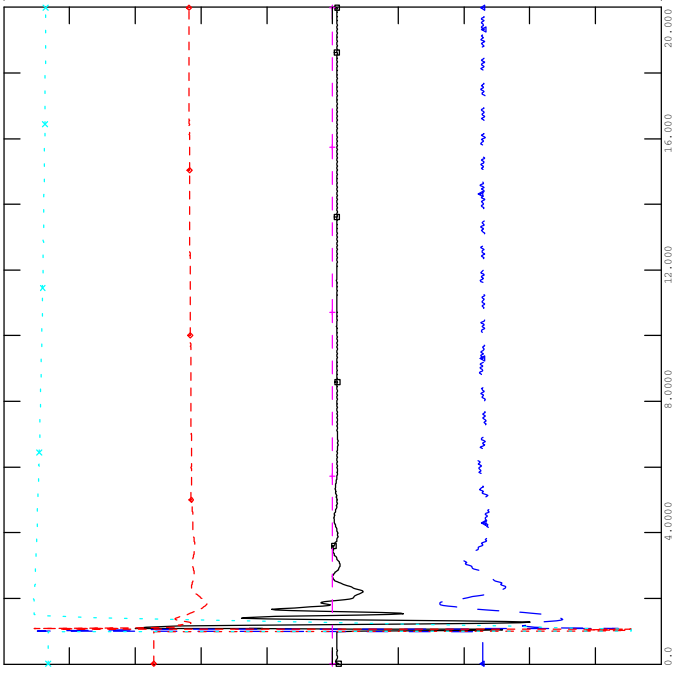
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1696 -0.1033
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5391 0.24390
CHNL# 6: [POWR 773[SECST 20.000]1] 1.0000 0.44820
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.31390 0.06350



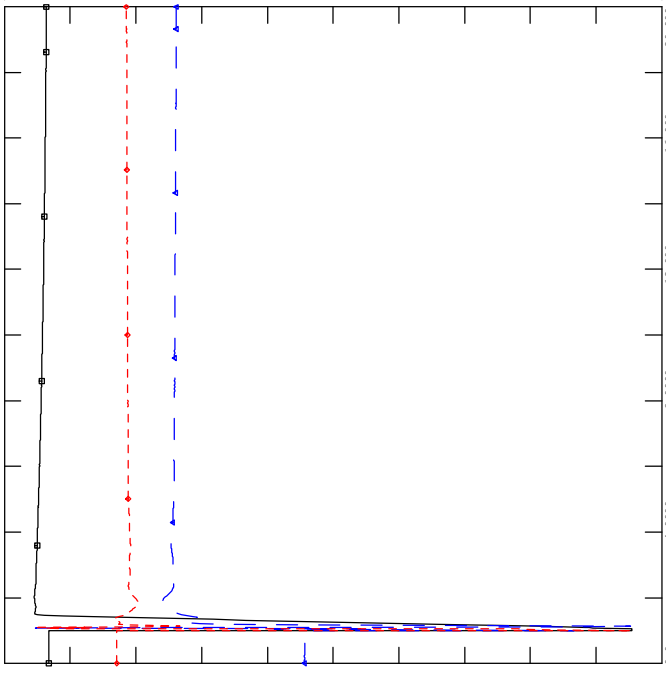
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2521 0.01180
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.6015 -0.1747
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1696 -0.1033



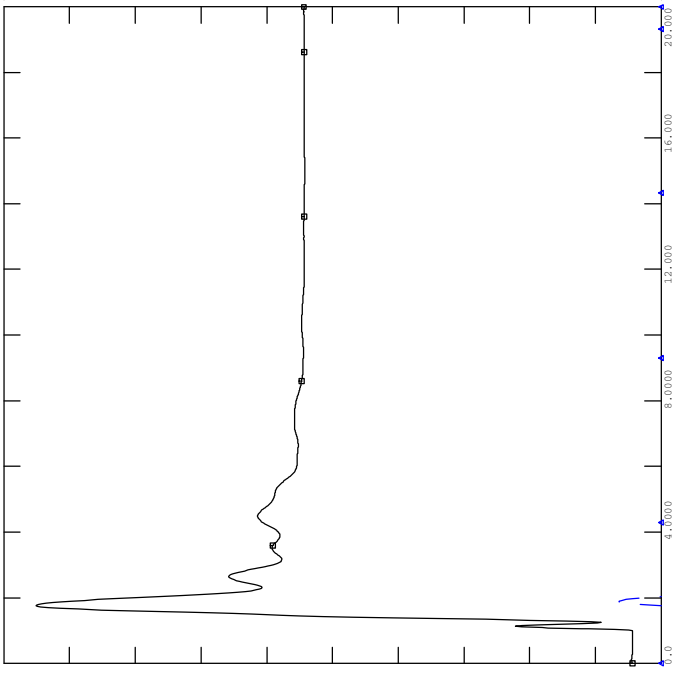
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.51 -41.77
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 11.752 -7.598



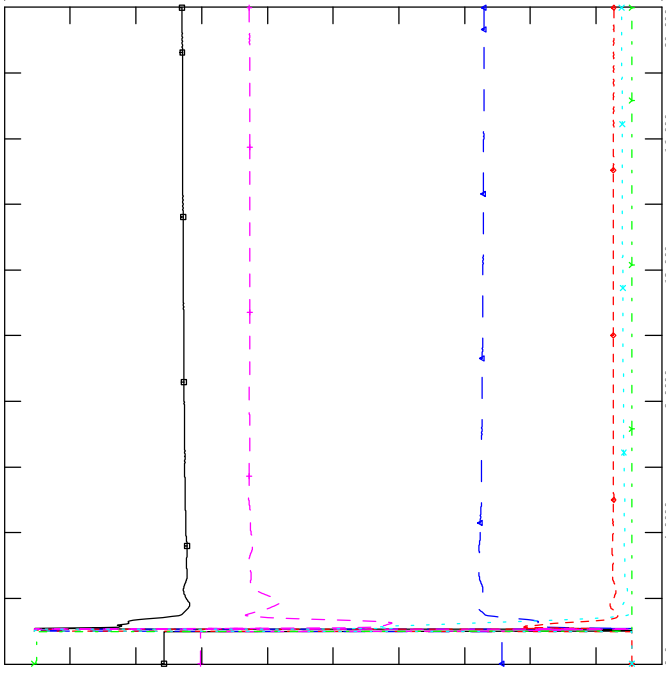
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
28303. -1348.
CHNL# 39: [POWR 669 TO 547004 CKT '74']
17.645 -366.0
CHNL# 37: [POWR 662 TO 720 CKT '64']
68.716 -17.41
CHNL# 35: [POWR 669 TO 720 CKT '64']
12.204 -247.2
CHNL# 33: [POWR 477 TO 662 CKT '83']
11.017 -205.4
CHNL# 31: [POWR 477 TO 547004 CKT '74']
205.37 -11.07



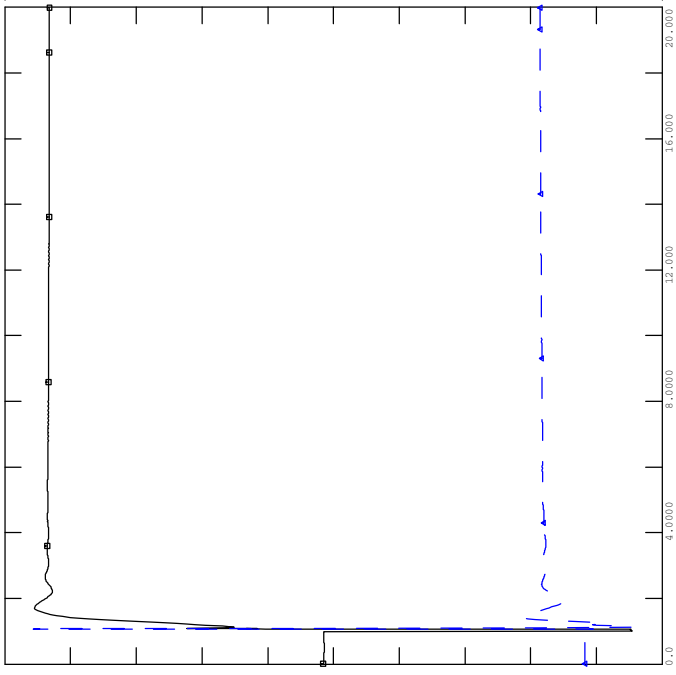
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
260.66 -43.13
CHNL# 43: [POWR 669 TO 1012 CKT '35']
587.69 -28.34



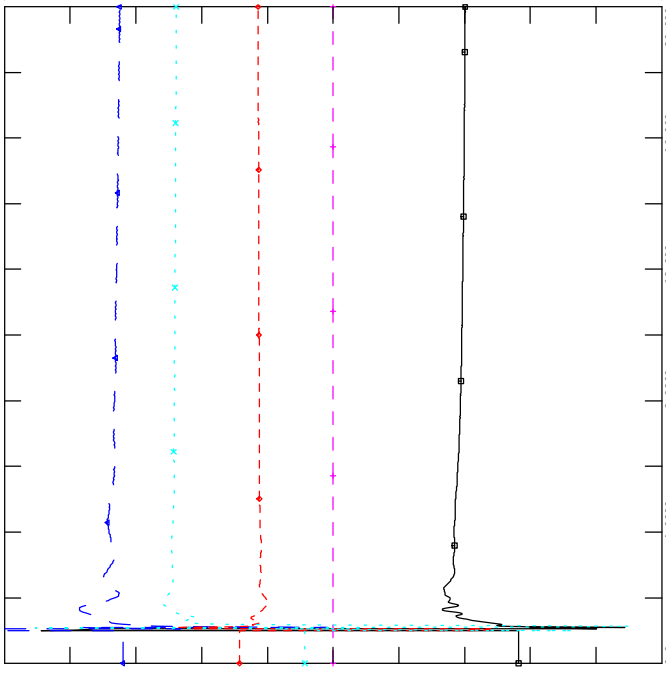
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.6015 -0.1747
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.15680 -0.0347
CHNL# 11: [VARS 773[SECST 20.000]1]
0.75490 -0.5616
CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.77270 -0.1208



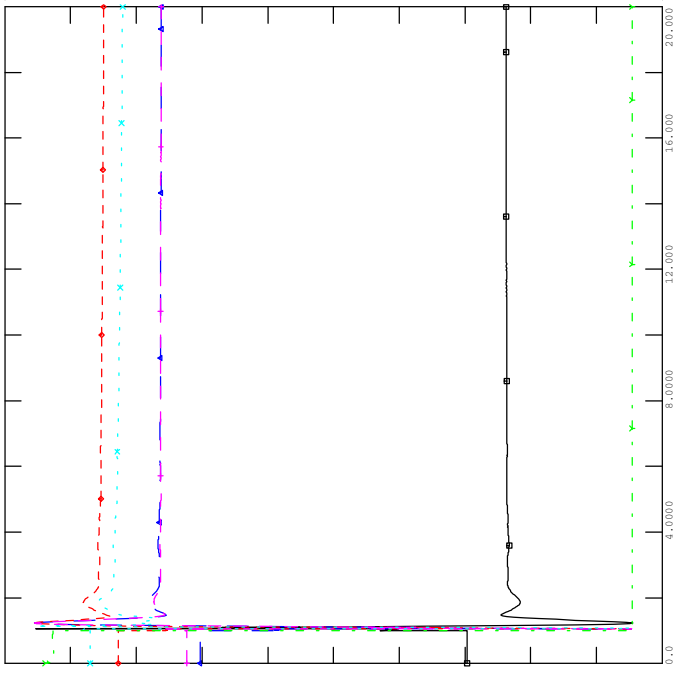
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_08_1034L_BOWMANTON

FILE: Scn4_SL_08_1034L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
499.68 -23.79
CHNL# 40: [VARS 669 TO 547004 CKT '74']
25.222 -192.1
CHNL# 38: [VARS 662 TO 720 CKT '64']
47.204 -125.5
CHNL# 36: [VARS 669 TO 720 CKT '64']
56.409 -171.3
CHNL# 34: [VARS 477 TO 662 CKT '83']
81.550 -111.3
CHNL# 32: [VARS 477 TO 547004 CKT '74']
111.34 -81.55



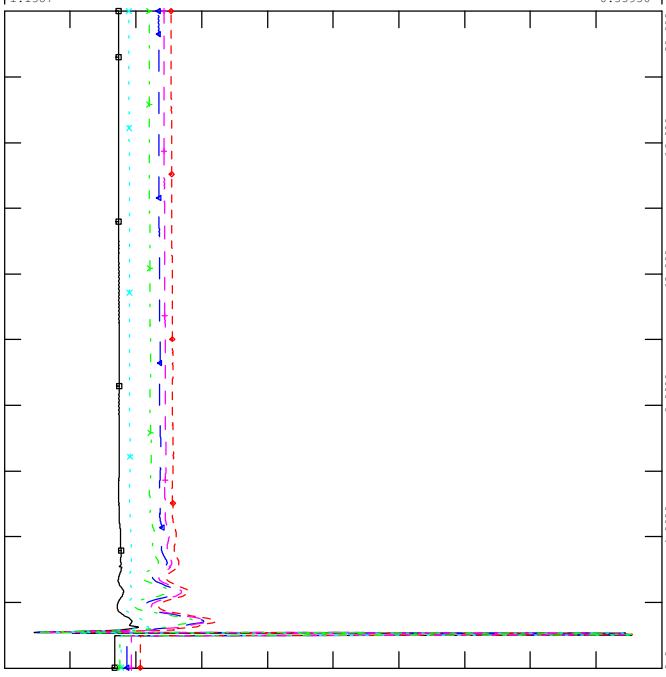
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1674 0.32680
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.2714 0.05590
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.2851 0.08470
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3277 0.01520
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2179 0.19090
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1587 0.33930



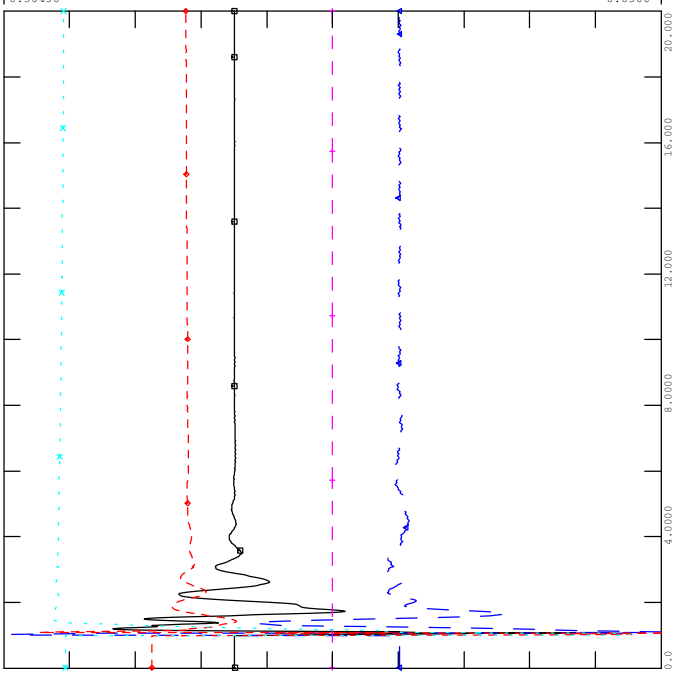
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2350 -0.1064
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5411 0.20620
CHNL# 6: [POWR 773[SECST 20.000]1] 1.2622 0.15890
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.30430 -0.0300



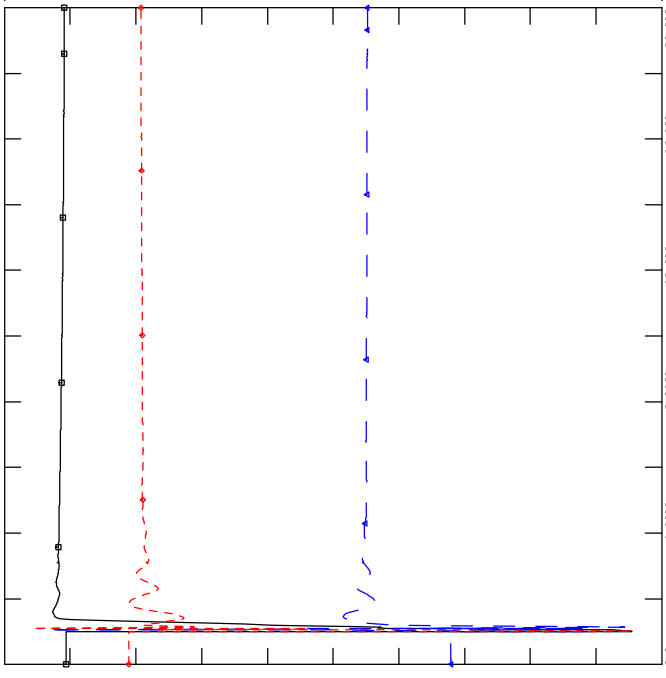
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2224 0.25860
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.6366 -0.0808
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2350 -0.1064



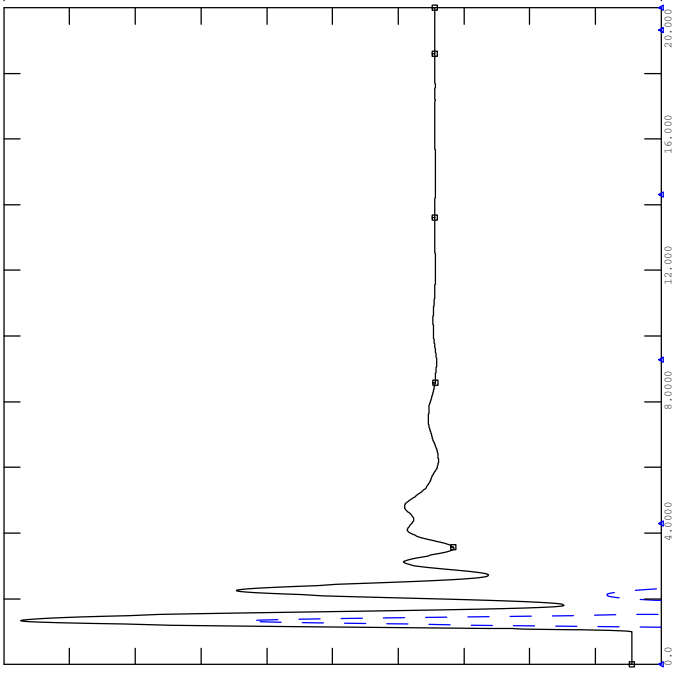
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -31.40 -42.02
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 27.247 -8.333

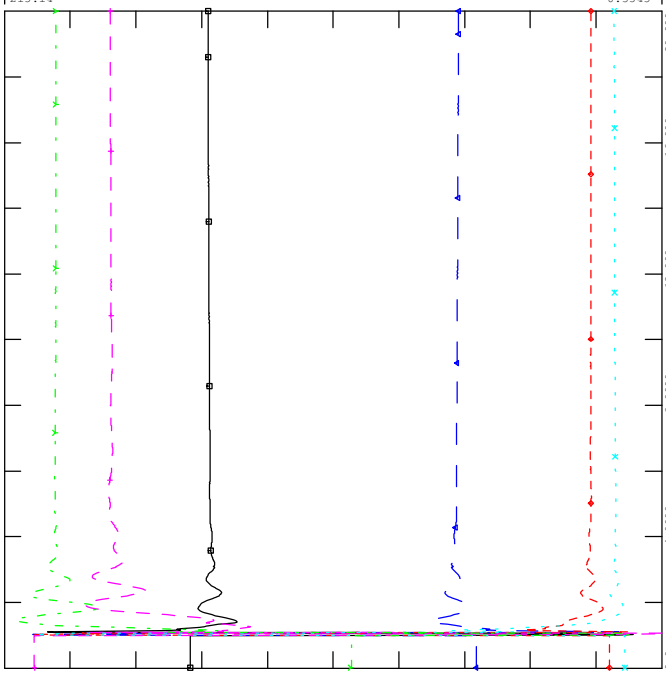


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
594.01 -22.75
CHNL# 39: [POWR 669 TO 547004 CKT '74']
11.771 -370.1
CHNL# 37: [POWR 662 TO 720 CKT '64']
45.571 -10.04
CHNL# 35: [POWR 669 TO 720 CKT '64']
3.7537 -256.2
CHNL# 33: [POWR 477 TO 662 CKT '83']
0.57990 -213.1
CHNL# 31: [POWR 477 TO 547004 CKT '74']
213.14 -0.5345

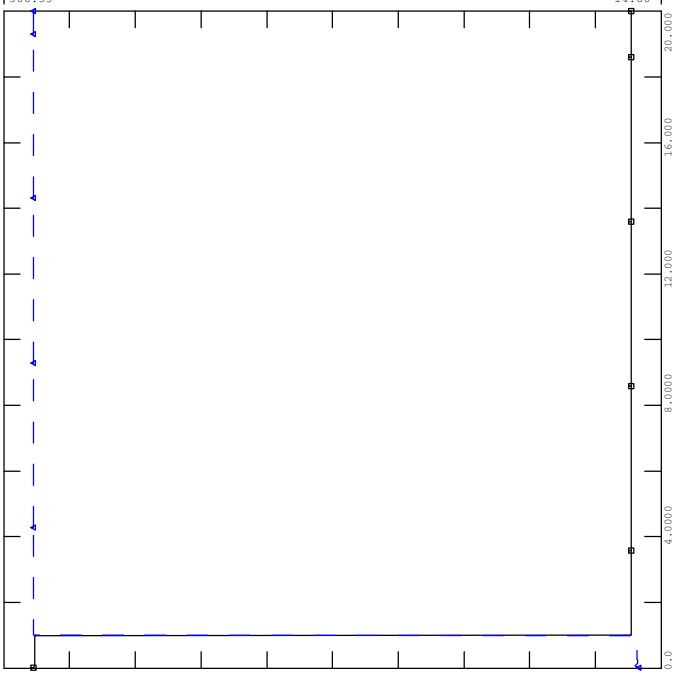


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
0.35570 -7.469
CHNL# 43: [POWR 669 TO 1012 CKT '35']
306.55 -14.60

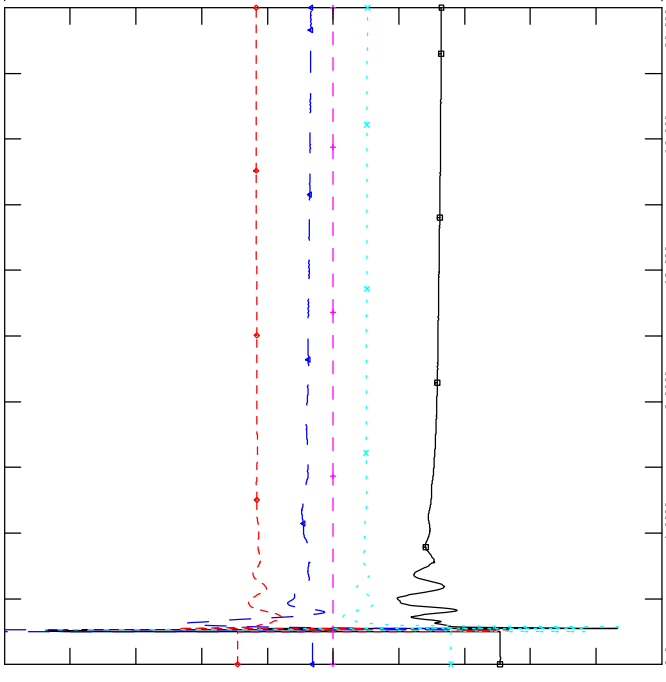


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14 REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.6366 -0.0808
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.15680 -0.0363
CHNL# 11: [VARS 773[SECST 20.000]1]
1.8792 -1.027
CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.68030 -0.1237

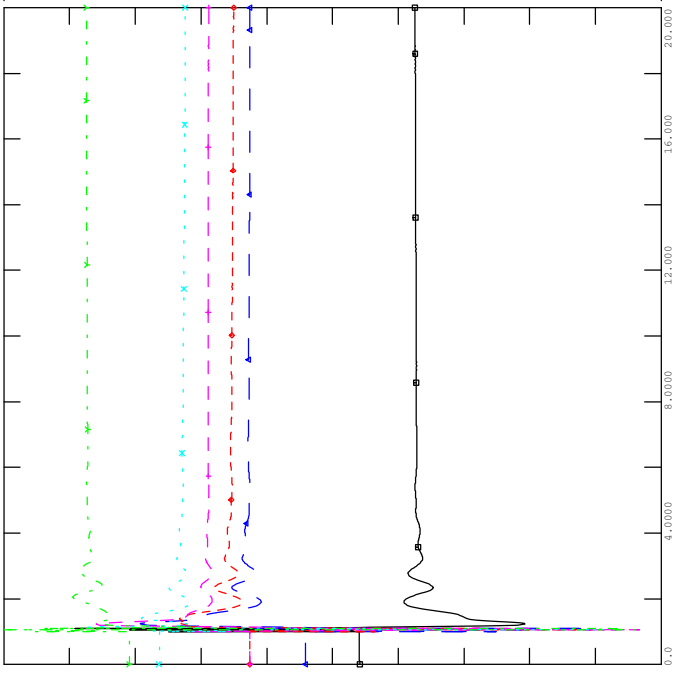


SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_09_1035L_NEWELL

FILE: Scn4_SL_09_1035L_Newell.out

FRI, JAN 31 2020 11:14 BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
65.772 -351.4
CHNL# 40: [VARS 669 TO 547004 CKT '74']
61.347 -211.1
CHNL# 38: [VARS 662 TO 720 CKT '64']
40.629 -69.77
CHNL# 36: [VARS 669 TO 720 CKT '64']
92.455 -108.8
CHNL# 34: [VARS 477 TO 662 CKT '83']
86.479 -49.13
CHNL# 32: [VARS 477 TO 547004 CKT '74']
49.132 -86.48



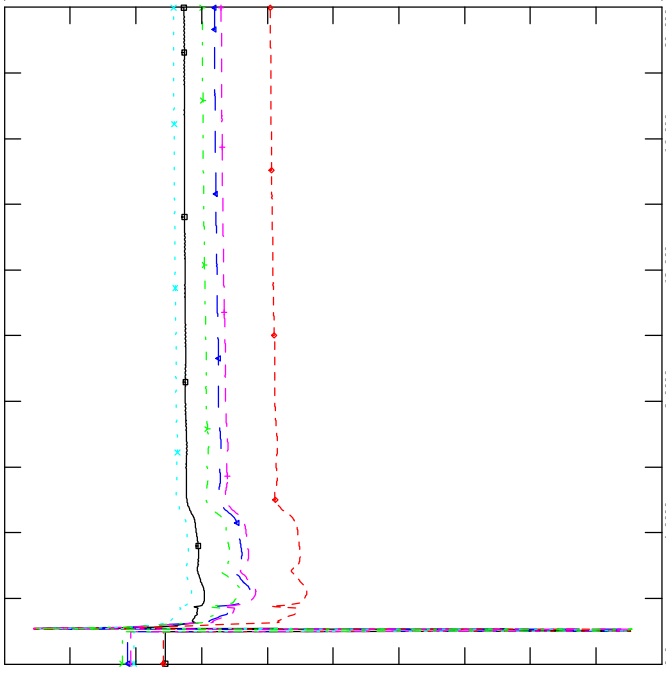
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1953 0.21890
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1603 0.62900
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.3173 -0.0540
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.3928 -0.0021
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.2471 0.06970
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1157 0.72990



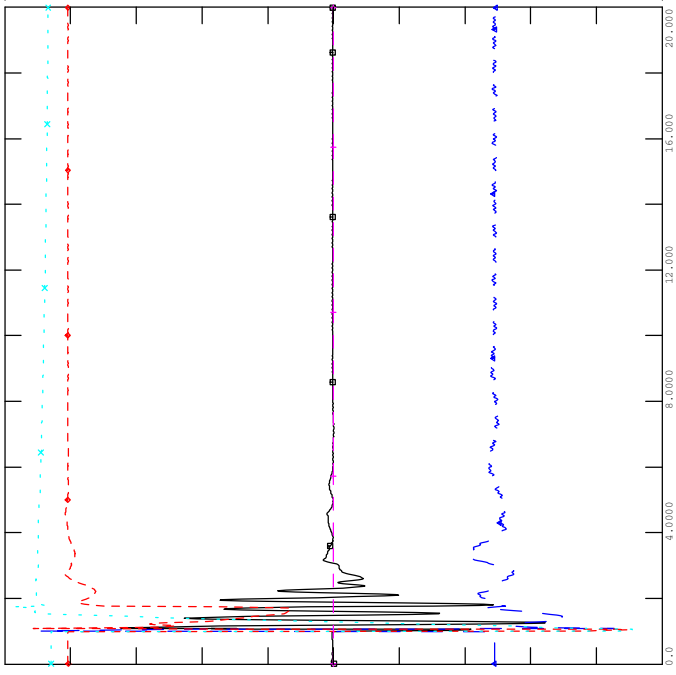
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1756 -0.1036
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2030 0.25810
CHNL# 6: [POWR 773[SECST 20.000]1] 0.99990 0.46030
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.32990 0.04310



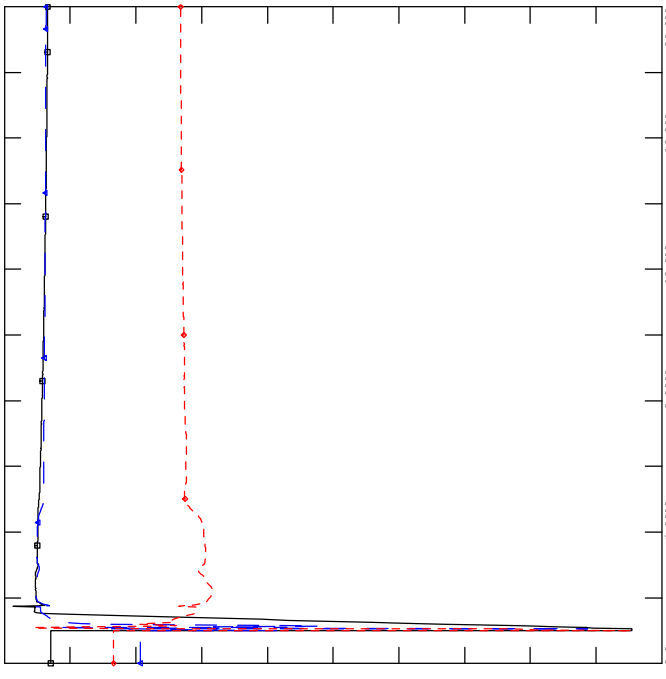
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2448 0.01210
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.5171 -1.998
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1756 -0.1036



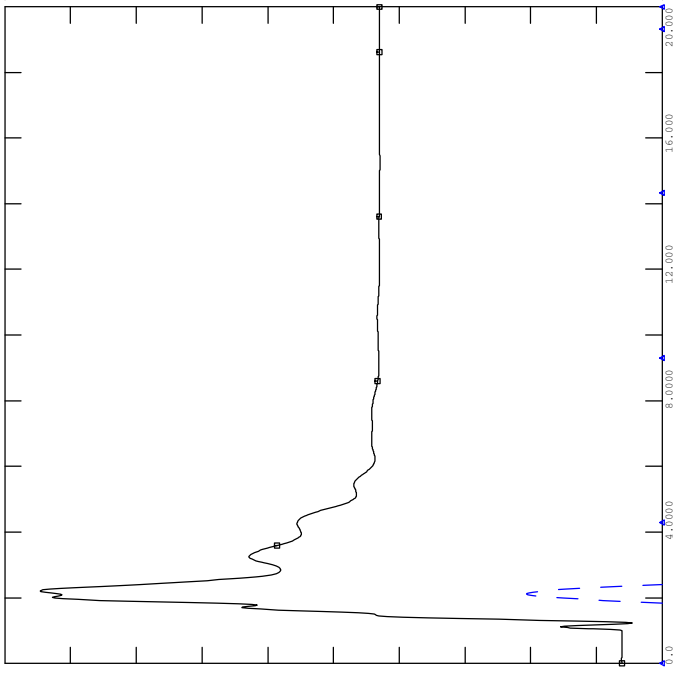
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.13 -41.94
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 20.902 -8.548



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
584.54 -31.34

CHNL# 39: [POWR 669 TO 547004 CKT '74']
19.694 -366.1

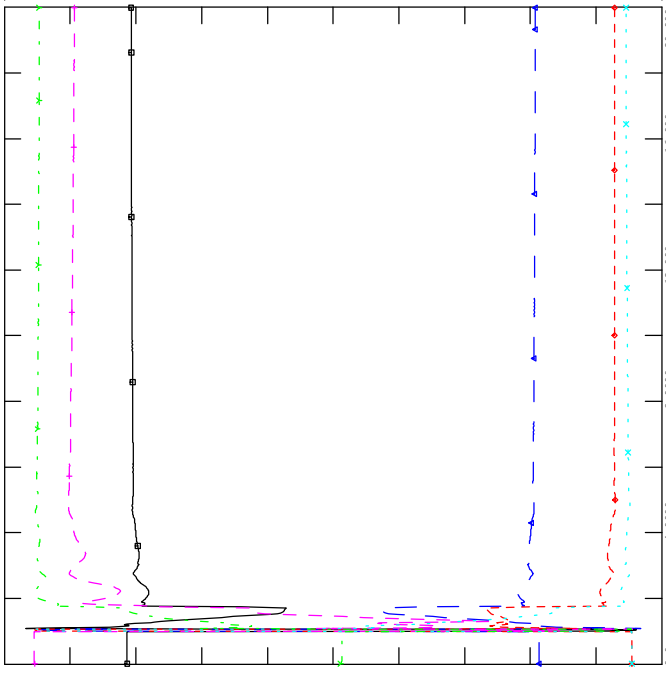
CHNL# 37: [POWR 662 TO 720 CKT '64']
45.308 -4.524

CHNL# 35: [POWR 669 TO 720 CKT '64']
13.787 -247.3

CHNL# 33: [POWR 477 TO 662 CKT '83']
17.036 -191.8

CHNL# 31: [POWR 477 TO 547004 CKT '74']
191.76 -17.02

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

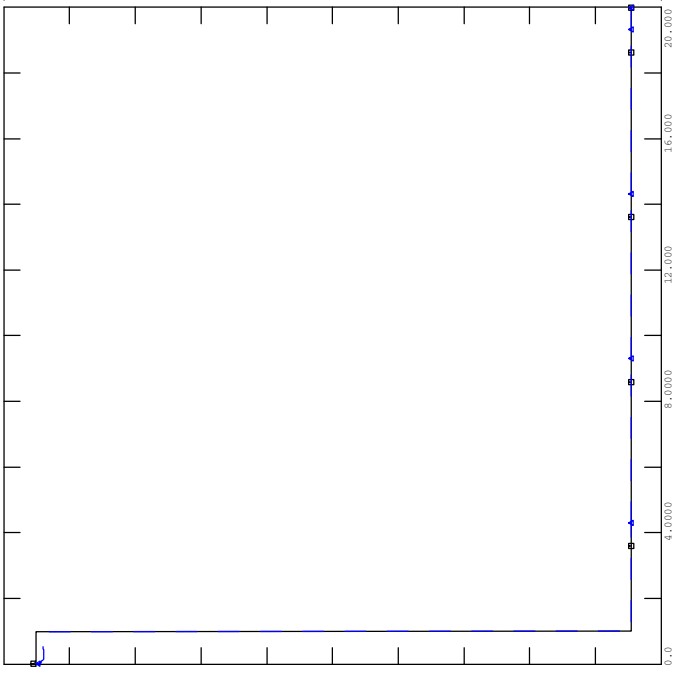
FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
1159.9 -55.23

CHNL# 43: [POWR 669 TO 1012 CKT '35']
30415. -1448.

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.5171 -1.998

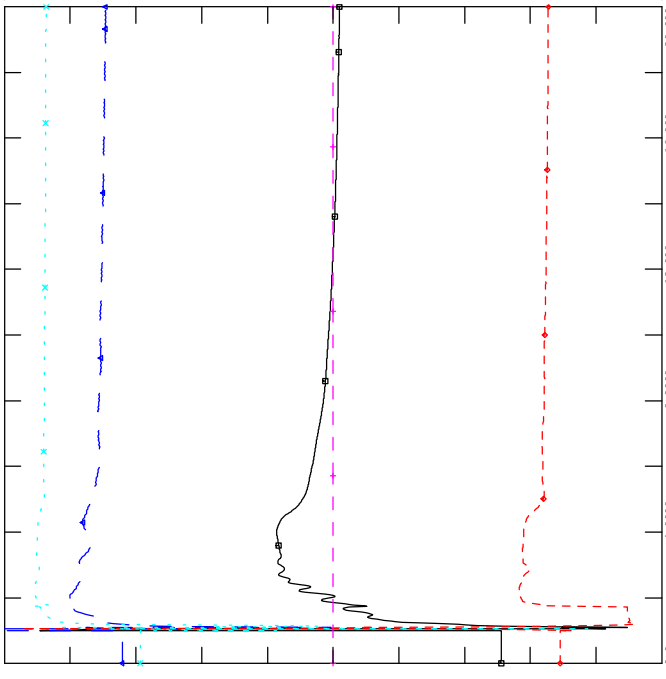
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
3.2405 -0.4873

CHNL# 11: [VARS 773[SECST 20.000]1]
0.75570 -0.5718

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.77270 -0.1522

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_10_1035L_BOWMANTON

FILE: Scn4_SL_10_1035L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
330.18 -139.0

CHNL# 40: [VARS 669 TO 547004 CKT '74']
85.564 -222.8

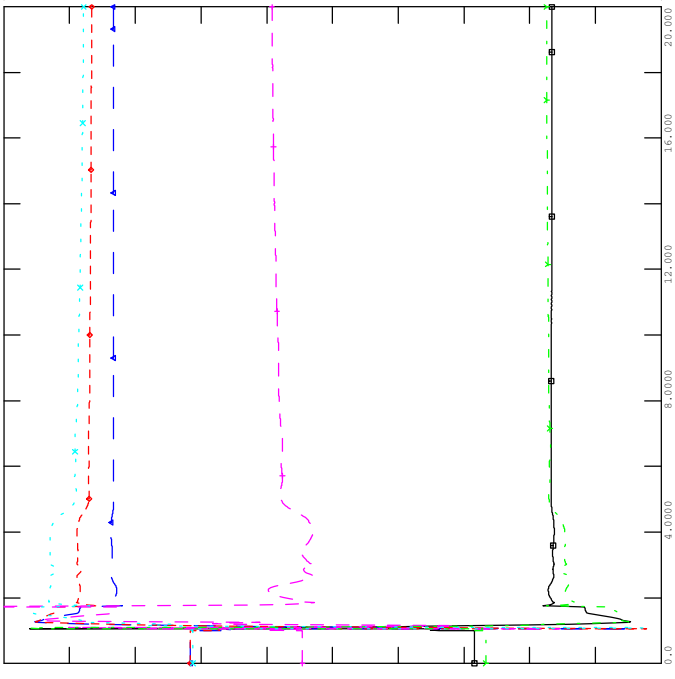
CHNL# 38: [VARS 662 TO 720 CKT '64']
21.261 -26.94

CHNL# 36: [VARS 669 TO 720 CKT '64']
139.23 -291.9

CHNL# 34: [VARS 477 TO 662 CKT '83']
159.10 -315.9

CHNL# 32: [VARS 477 TO 547004 CKT '74']
315.54 -159.1

TIME (SECONDS)



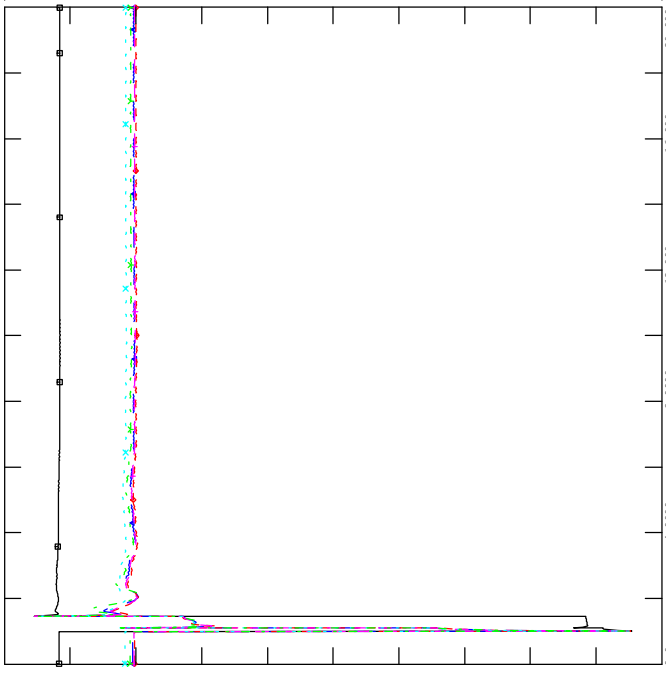
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0401 0.93480
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0831 0.93260
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0835 0.93240
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0883 0.92630
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0515 0.92240
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0709 0.47650



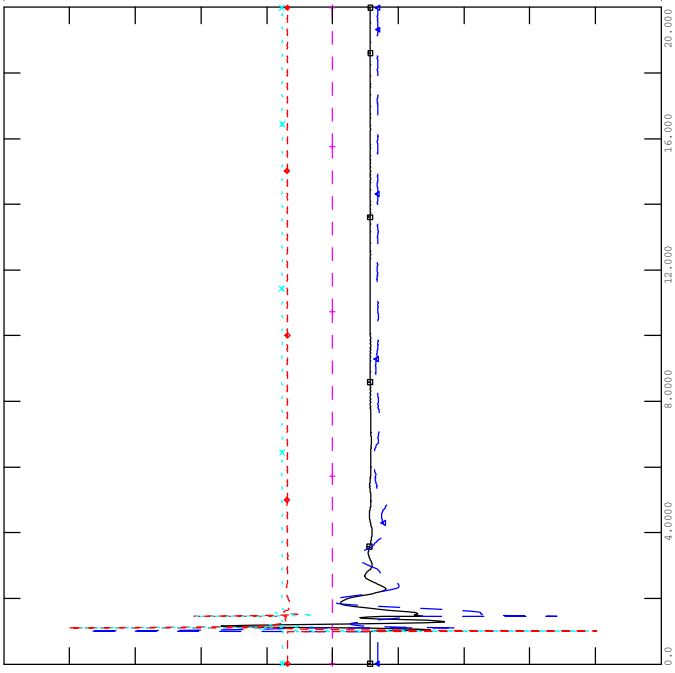
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2099 1.7520
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2394 1.7214
CHNL# 6: [POWR 773[SECST 20.000]1] 0.79360 0.44960
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.27140 0.12000



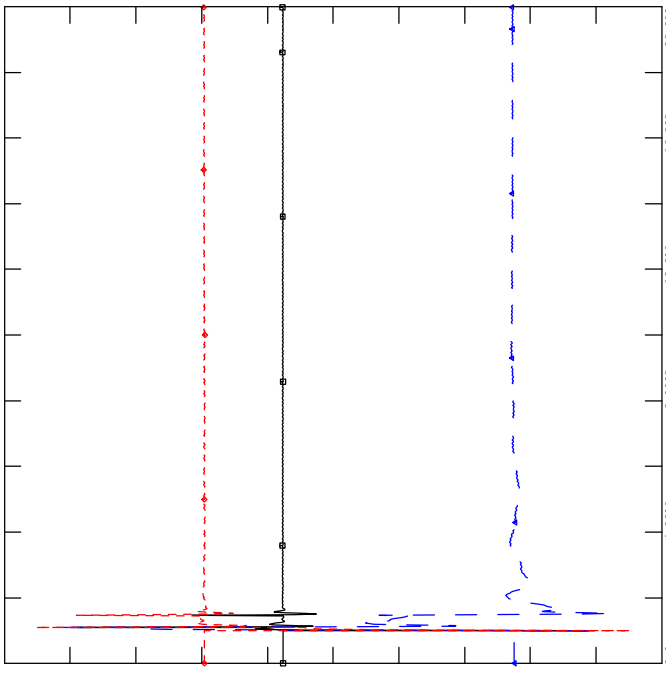
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0915 0.92190
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2832 0.64830
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.2099 1.7520



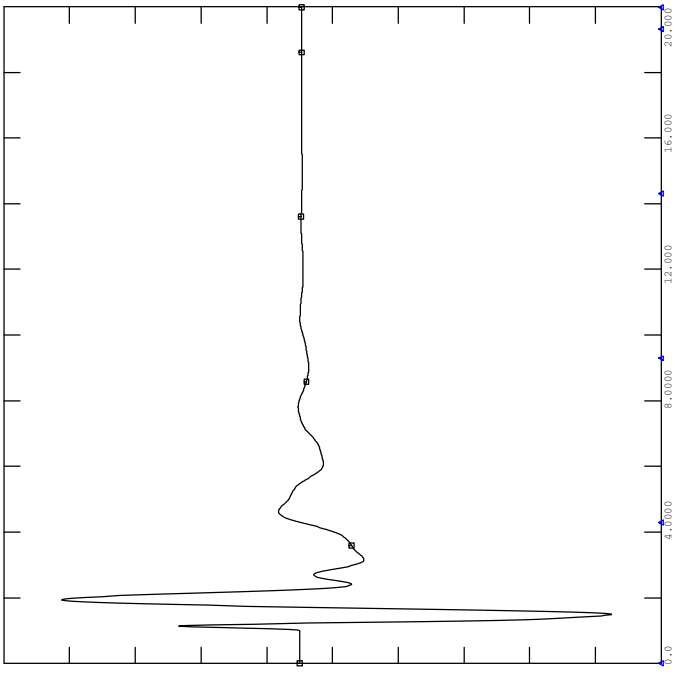
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.20 -41.12
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -3.802 -10.35



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
293.59 235.64

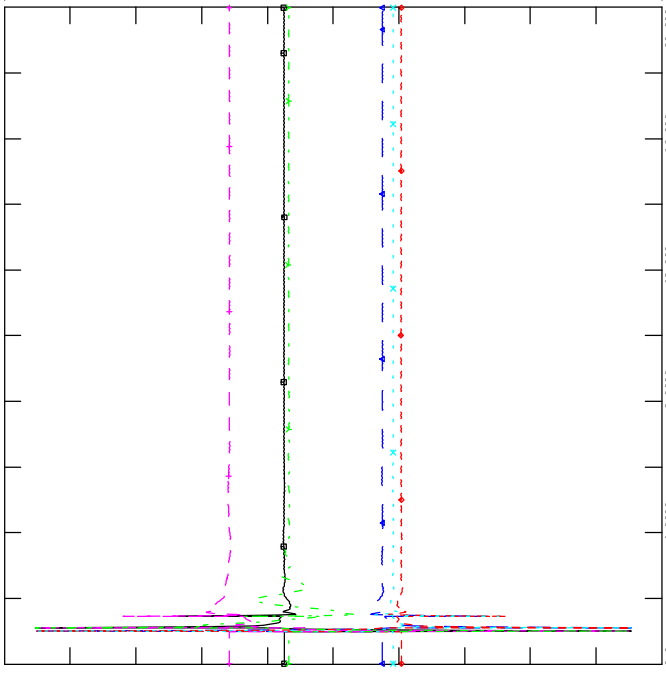
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-304.7 -378.8

CHNL# 37: [POWR 662 TO 720 CKT '64']
46.052 37.242

CHNL# 35: [POWR 669 TO 720 CKT '64']
-204.5 -255.7

CHNL# 33: [POWR 477 TO 662 CKT '83']
-132.1 -168.1

CHNL# 31: [POWR 477 TO 547004 CKT '74']
168.08 132.11



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

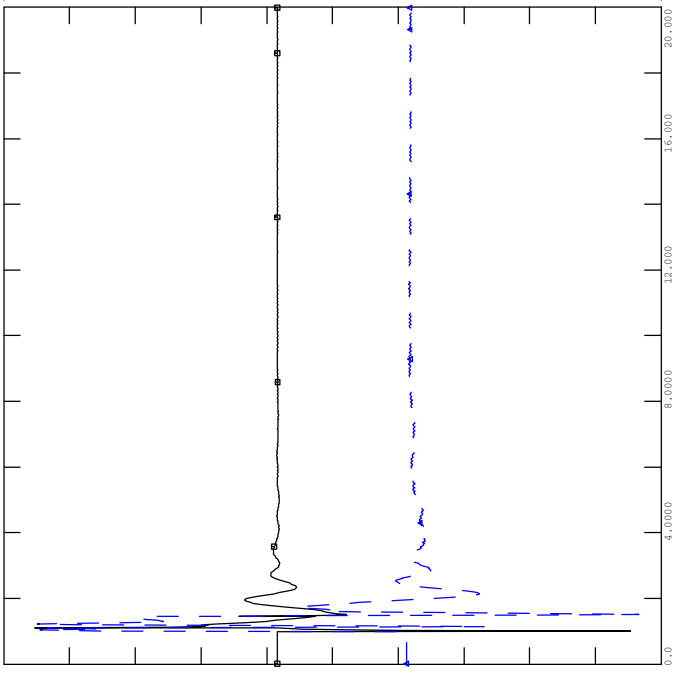
FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-3.158 -10.19

CHNL# 43: [POWR 669 TO 1012 CKT '35']
314.34 252.46



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

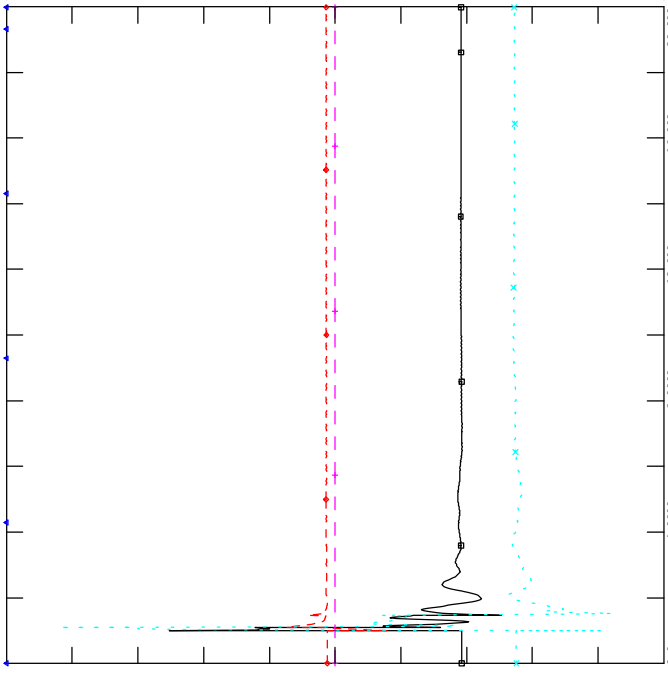
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
1.2832 0.64830

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.14600 0.02770

CHNL# 11: [VARS 773[SECST 20.000]1]
0.15450 -0.2772

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.21470 0.01140



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_11_892L_SUFFIELD

FILE: Scn4_SL_11_892L_Suffield.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-4.252 -17.10

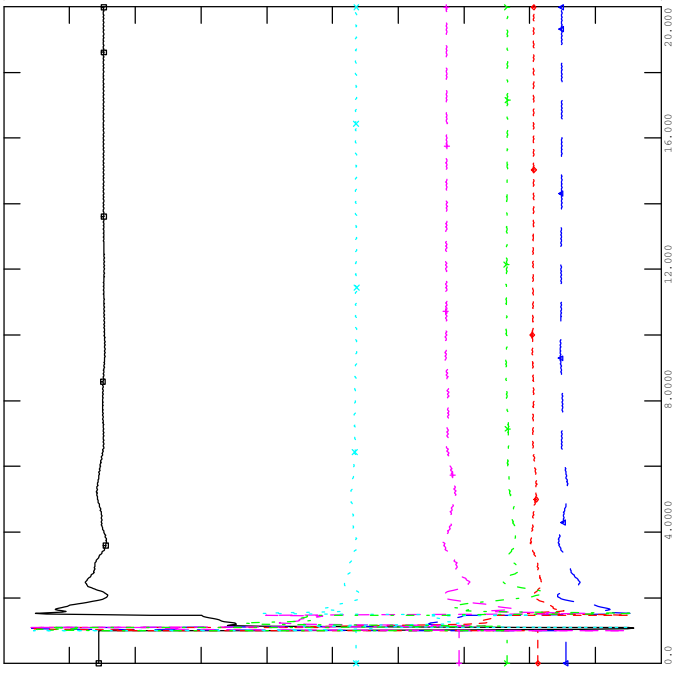
CHNL# 40: [VARS 669 TO 547004 CKT '74']
16.596 -20.07

CHNL# 38: [VARS 662 TO 720 CKT '64']
4.0885 -2.738

CHNL# 36: [VARS 669 TO 720 CKT '64']
32.533 13.520

CHNL# 34: [VARS 477 TO 662 CKT '83']
44.564 20.799

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-20.80 -44.56



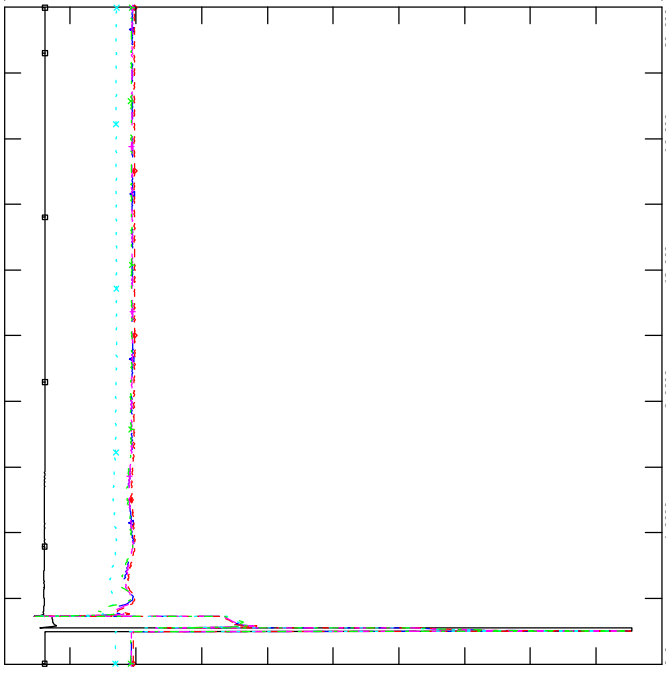
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0411 0.93130
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0814 0.92810
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0840 0.92750
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0892 0.92090
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0522 0.91810
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0907 -0.0406



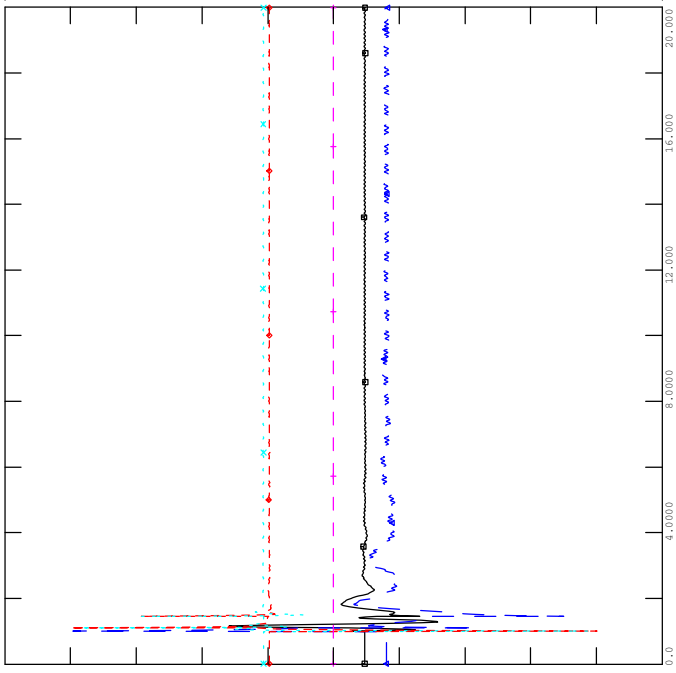
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1928 1.7432
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2210 1.7113
CHNL# 6: [POWR 773[SECST 20.000]1] 0.82290 0.43540
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.26720 0.12070



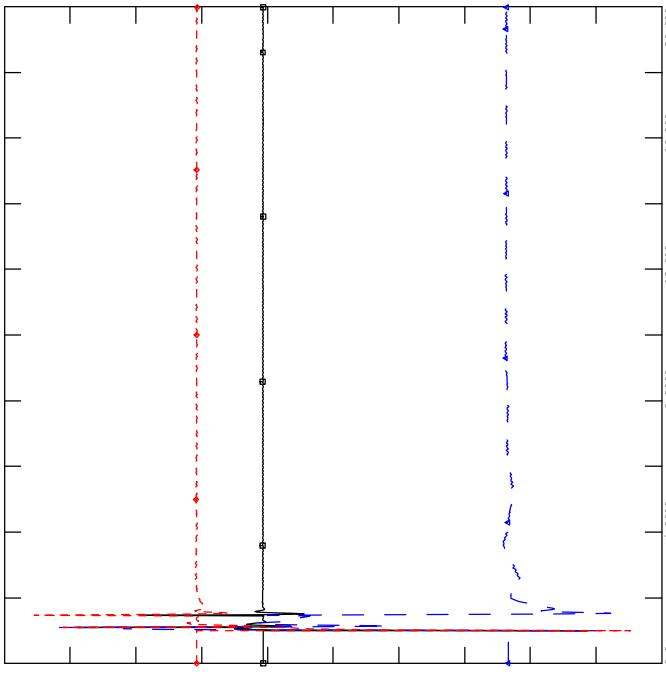
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0907 0.91720
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2729 0.64340
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1928 1.7432



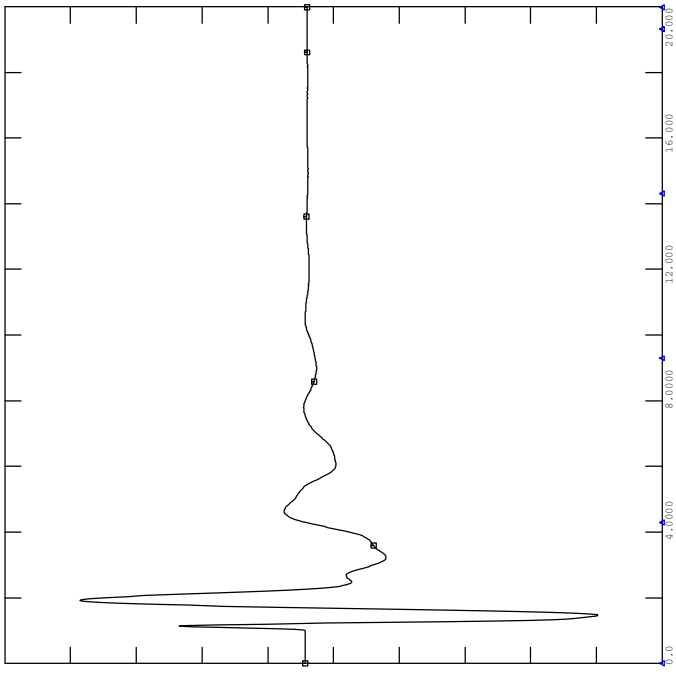
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.45 -41.10
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -4.440 -9.490



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
290.95 235.36

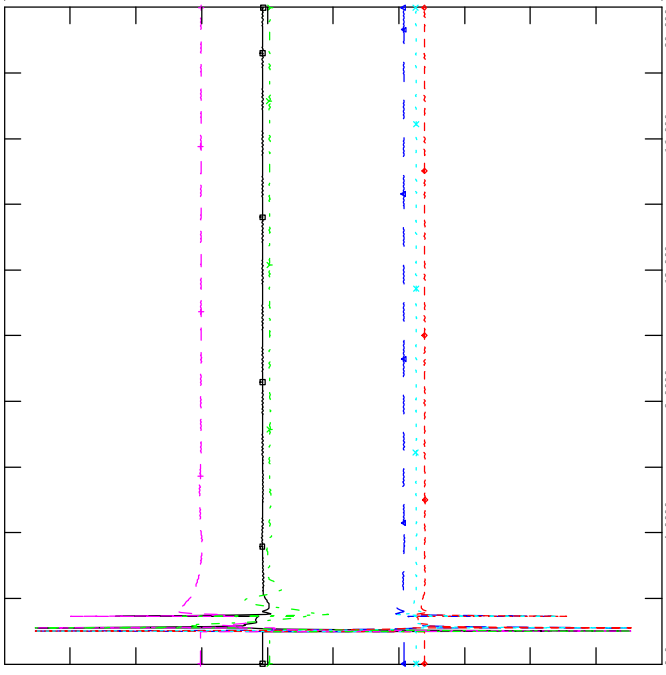
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-303.1 -375.6

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.600 37.029

CHNL# 35: [POWR 669 TO 720 CKT '64']
-203.3 -253.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
-131.3 -166.6

CHNL# 31: [POWR 477 TO 547004 CKT '74']
166.64 131.35



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

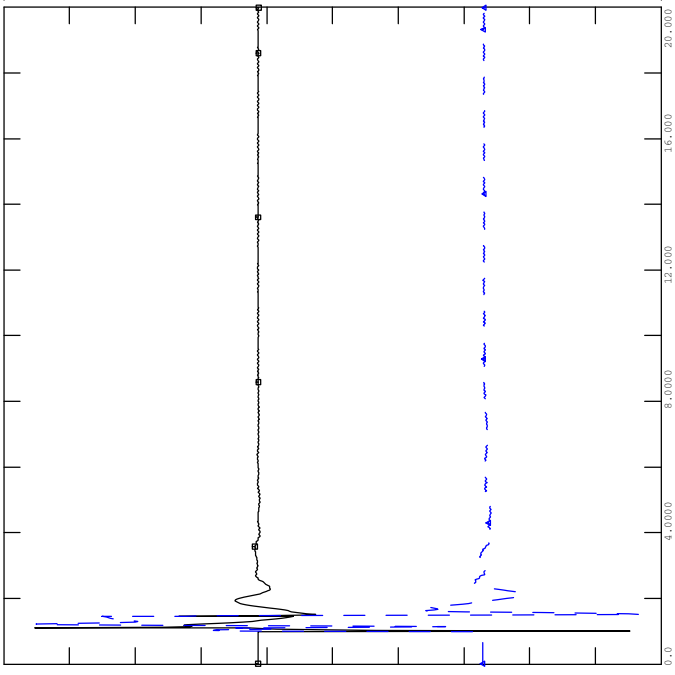
FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-0.6124 -10.02

CHNL# 43: [POWR 669 TO 1012 CKT '35']
311.66 252.00



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

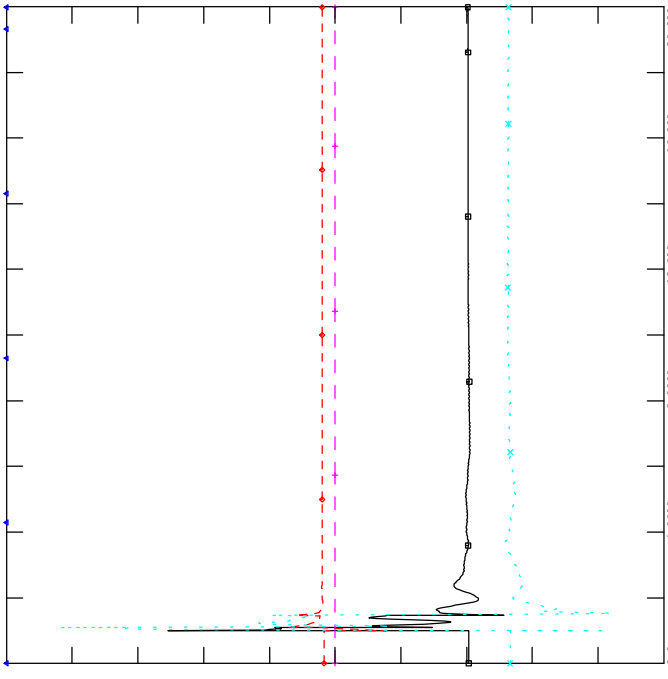
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
1.2729 0.64340

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.14530 0.02730

CHNL# 11: [VARS 773[SECST 20.000]1]
0.18430 -0.2772

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.21820 0.01300



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_12_892L_BOWMANTON

FILE: Scn4_SL_12_892L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-4.343 -16.79

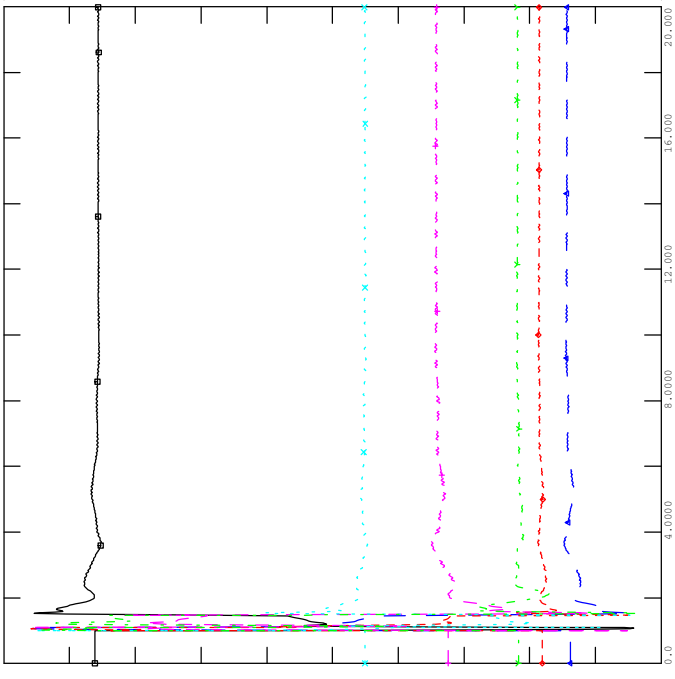
CHNL# 40: [VARS 669 TO 547004 CKT '74']
17.327 -19.78

CHNL# 38: [VARS 662 TO 720 CKT '64']
3.8694 -2.801

CHNL# 36: [VARS 669 TO 720 CKT '64']
32.865 13.601

CHNL# 34: [VARS 477 TO 662 CKT '83']
44.749 20.940

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-20.94 -44.75



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0948 0.19490
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0981 0.87520
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1079 0.54930
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1079 0.50470
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0850 0.33820
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0614 0.89830

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8263 0.41830
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3576 0.86160
CHNL# 6: [POWR 773[SECST 20.000]1] 0.84510 0.41490
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.29670 0.04890

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1904 0.55750
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0265 0.37030
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8263 0.41830

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.55 -40.48
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -0.5259 -16.76

0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000
TIME (SECONDS)

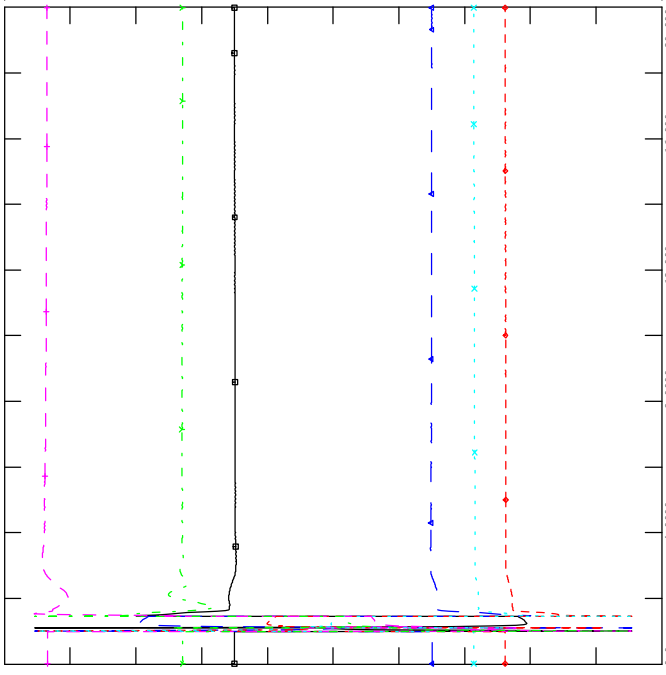
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 340.35 75.759
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -115.5 -442.1
CHNL# 37: [POWR 662 TO 720 CKT '64'] 45.553 7.1918
CHNL# 35: [POWR 669 TO 720 CKT '64'] -91.86 -280.3
CHNL# 33: [POWR 477 TO 662 CKT '83'] -72.49 -196.0
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 195.98 72.492



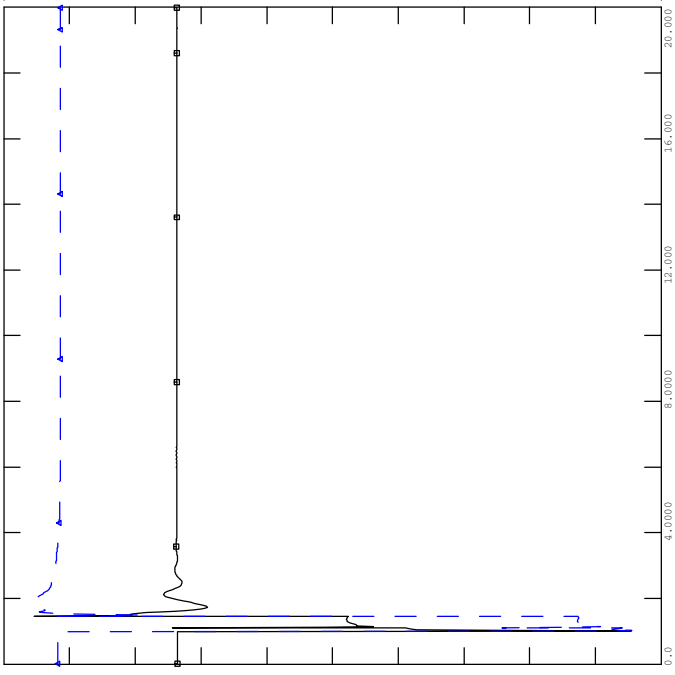
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 12.834 -234.0
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 361.34 85.681



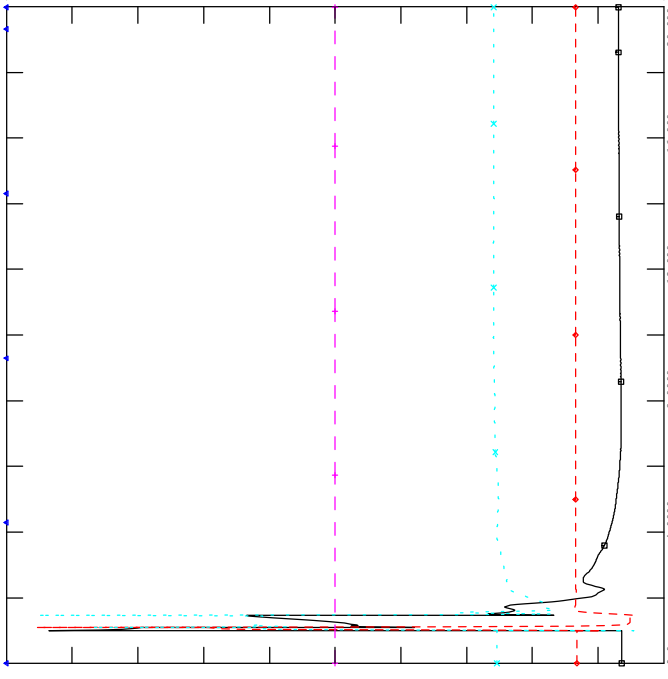
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1] 2.0265 0.37030
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 1.1625 -0.0757
CHNL# 11: [VARS 773[SECST 20.000]1] 0.24280 -0.2657
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.79890 0.02400



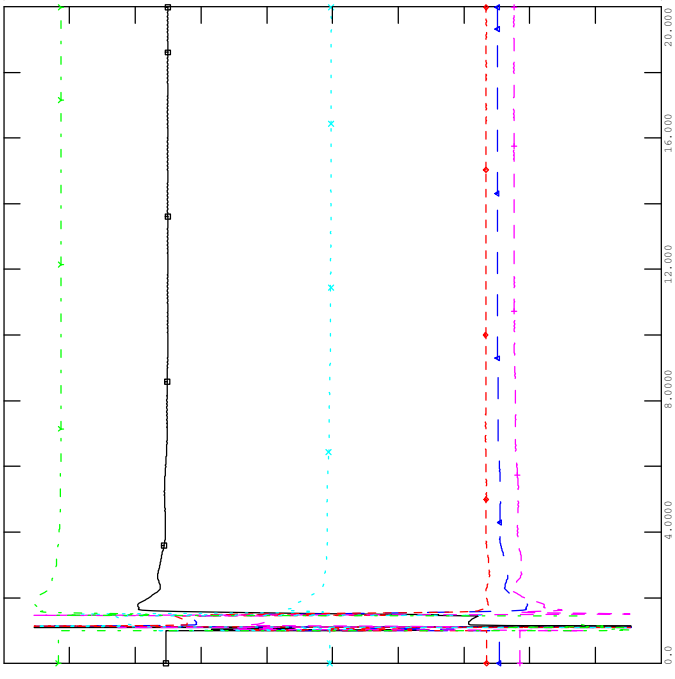
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_13_676L_BULLSHEAD

FILE: Scn4_SL_13_676L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 5.9839 -235.6
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 62.157 -69.39
CHNL# 38: [VARS 662 TO 720 CKT '64'] 23.035 -7.138
CHNL# 36: [VARS 669 TO 720 CKT '64'] 97.004 -11.80
CHNL# 34: [VARS 477 TO 662 CKT '83'] 93.531 1.5555
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -1.555 -93.53



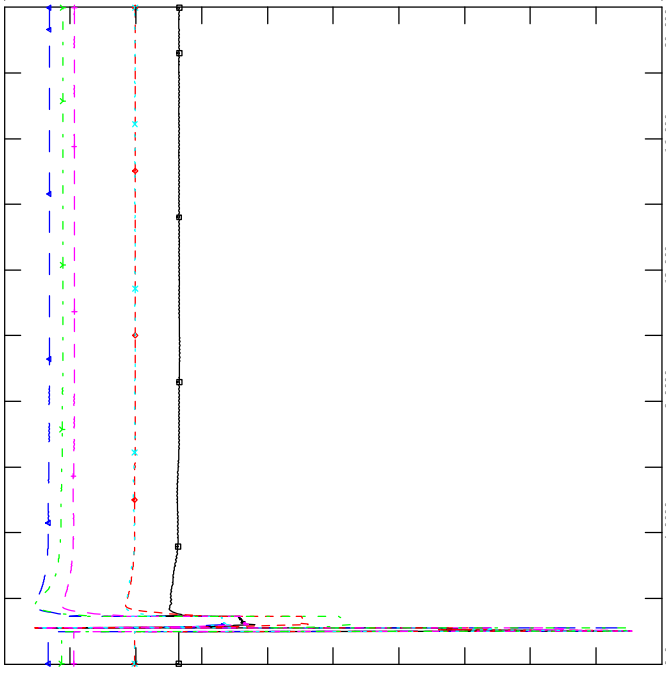
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1056 0.12060
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1294 0.75670
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1474 0.25660
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2827 0.13980
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1027 -0.0397
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0956 0.81640



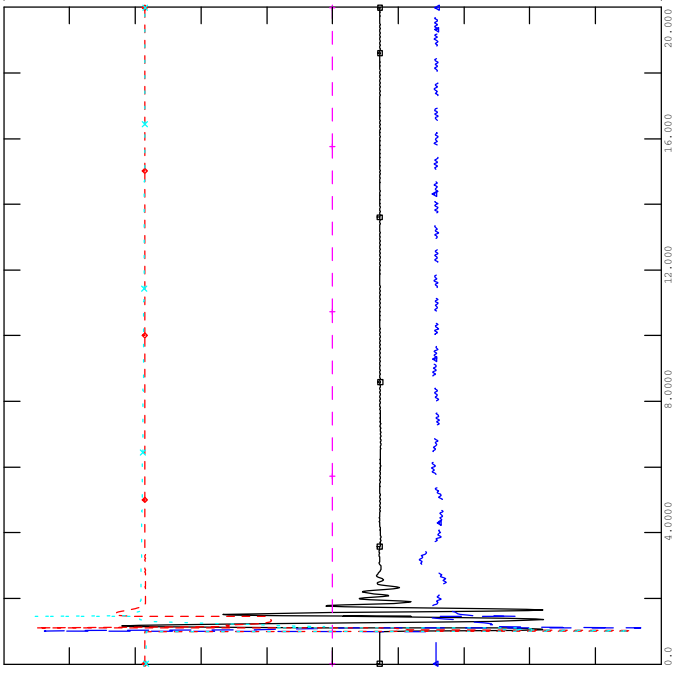
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6069 -0.1241
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5591 0.03010
CHNL# 6: [POWR 773[SECST 20.000]1] 0.94790 0.41590
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.34770 0.06670



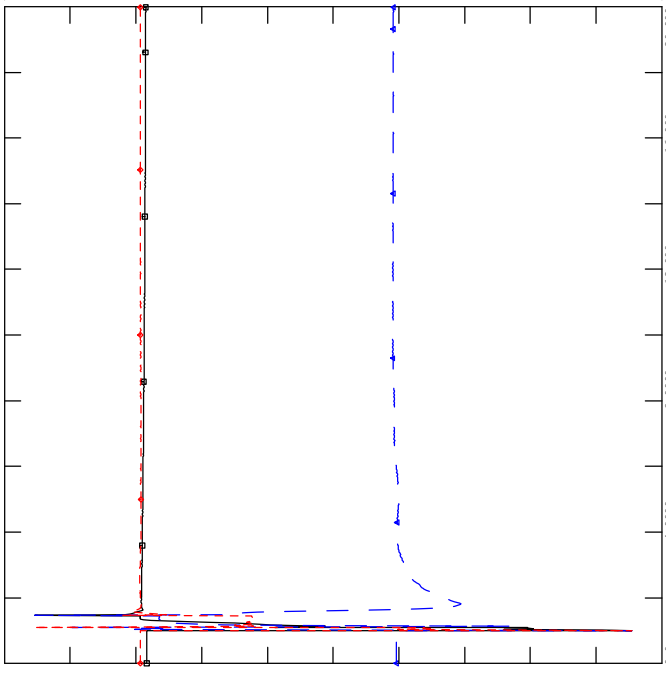
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2397 0.27460
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.6938 0.17960
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6069 -0.1241



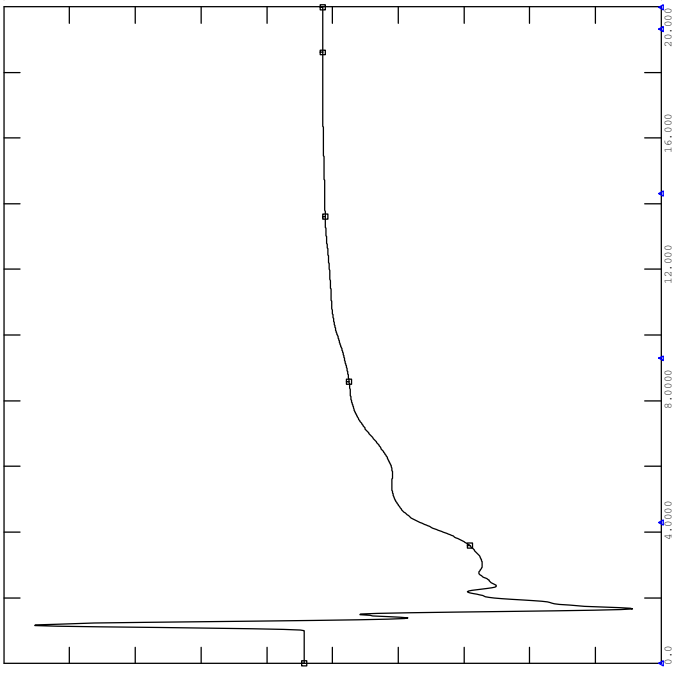
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.67 -41.23
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 1.1353 -16.10



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

CHNL# 41: [POWR 669 TO 918 CKT '34']
315.48 -15.81
CHNL# 39: [POWR 669 TO 547004 CKT '74']
14.169 -421.3
CHNL# 37: [POWR 662 TO 720 CKT '64']
46.277 -14.47
CHNL# 35: [POWR 669 TO 720 CKT '64']
11.130 -287.7
CHNL# 33: [POWR 477 TO 662 CKT '83']
10.104 -217.4
CHNL# 31: [POWR 477 TO 547004 CKT '74']
217.40 -10.10

FRI, JAN 31 2020 11:14
BRANCH FLOW

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

CHNL# 44: [VARS 669 TO 1012 CKT '35']
14.874 -219.9
CHNL# 43: [POWR 669 TO 1012 CKT '35']
335.50 -11.19

FRI, JAN 31 2020 11:14
BRANCH FLOW

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.6938 0.17960
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.2195 -0.2613
CHNL# 11: [VARS 773[SECST 20.000]1]
0.47100 -0.4851
CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.83000 0.02380

FRI, JAN 31 2020 11:14
REACTIVE POWER

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_14_676L_BOWMANTON

FILE: Scn4_SL_14_676L_Bowmanton.out

CHNL# 42: [VARS 669 TO 918 CKT '34']
7.9062 -221.7
CHNL# 40: [VARS 669 TO 547004 CKT '74']
82.803 -259.9
CHNL# 38: [VARS 662 TO 720 CKT '64']
20.289 -7.205
CHNL# 36: [VARS 669 TO 720 CKT '64']
118.89 -195.8
CHNL# 34: [VARS 477 TO 662 CKT '83']
121.46 -151.3
CHNL# 32: [VARS 477 TO 547004 CKT '74']
151.27 -121.5

FRI, JAN 31 2020 11:14
BRANCH FLOW

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

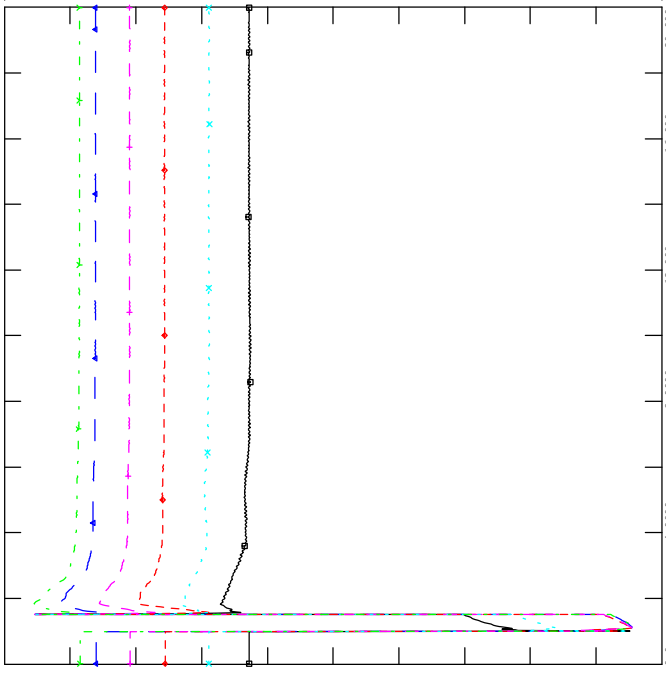
FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0900 0.48220
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1021 0.95220
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1313 0.72560
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1691 0.70660
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0988 0.57800
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0633 0.95090

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

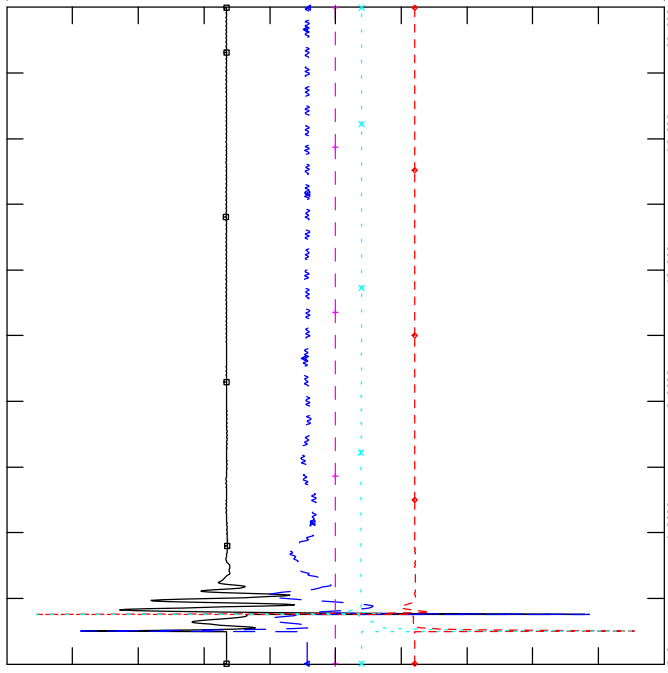
FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.9550 1.2155
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.2159 1.2826
CHNL# 6: [POWR 773[SECST 20.000]1] 0.77370 0.38910
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.32500 -0.0883

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

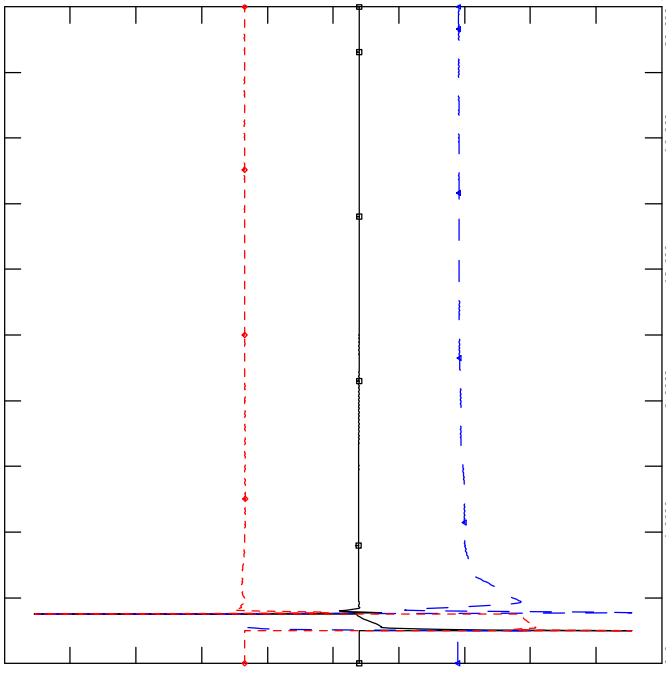
FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2168 0.73240
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0294 0.23280
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.9550 1.2155

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

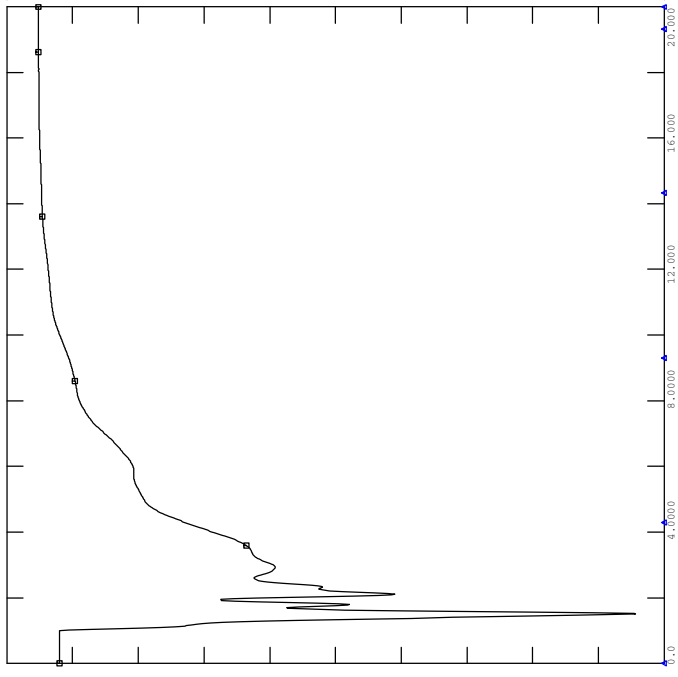
FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.48 -40.38
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -5.677 -19.03

TIME (SECONDS)



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
371.04 130.77

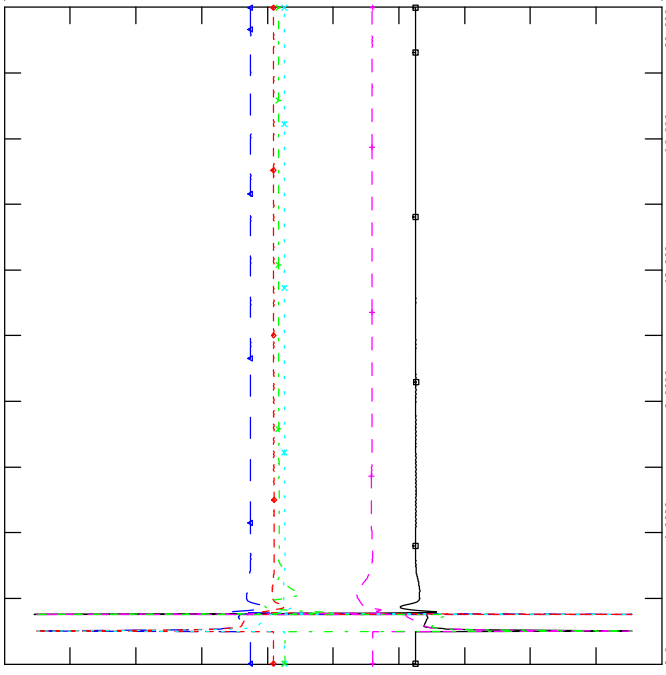
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-216.5 -526.6

CHNL# 37: [POWR 662 TO 720 CKT '64']
67.334 23.947

CHNL# 35: [POWR 669 TO 720 CKT '64']
-147.7 -361.9

CHNL# 33: [POWR 477 TO 662 CKT '83']
-98.81 -242.9

CHNL# 31: [POWR 477 TO 547004 CKT '74']
242.92 98.809



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

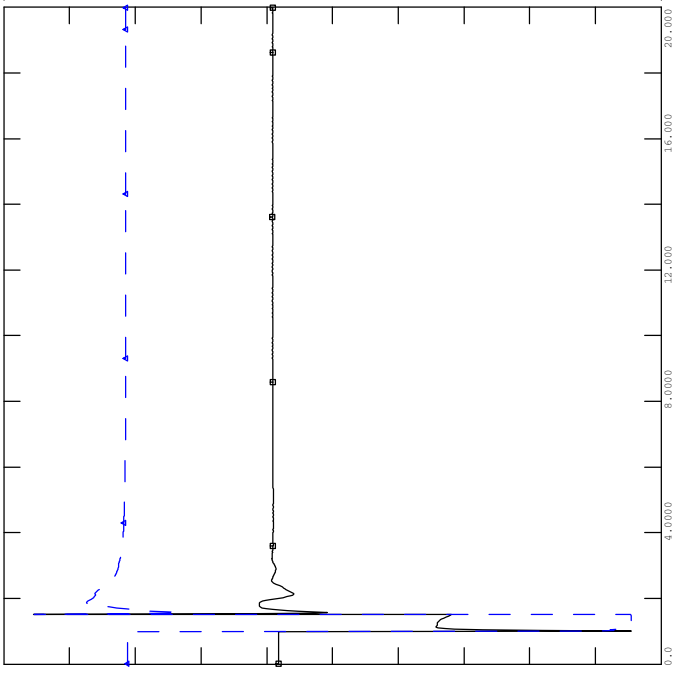
FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
38.848 -207.6

CHNL# 43: [POWR 669 TO 1012 CKT '35']
392.19 144.40



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

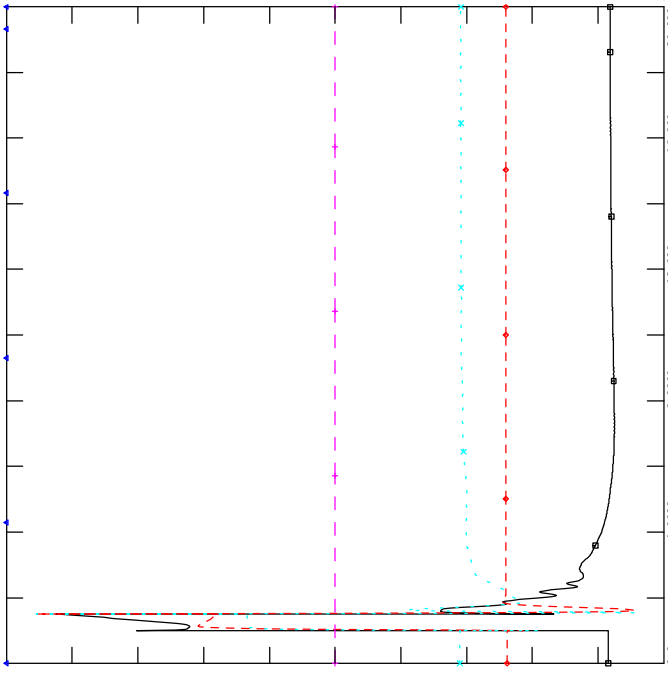
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
2.0294 0.23280

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.97160 -0.1889

CHNL# 11: [VARS 773[SECST 20.000]1]
0.08000 -0.2735

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.68210 0.01790



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_15_600L_PEACEBUTTE

FILE: Scn4_SL_15_600L_Peacebutte.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
30.041 -210.3

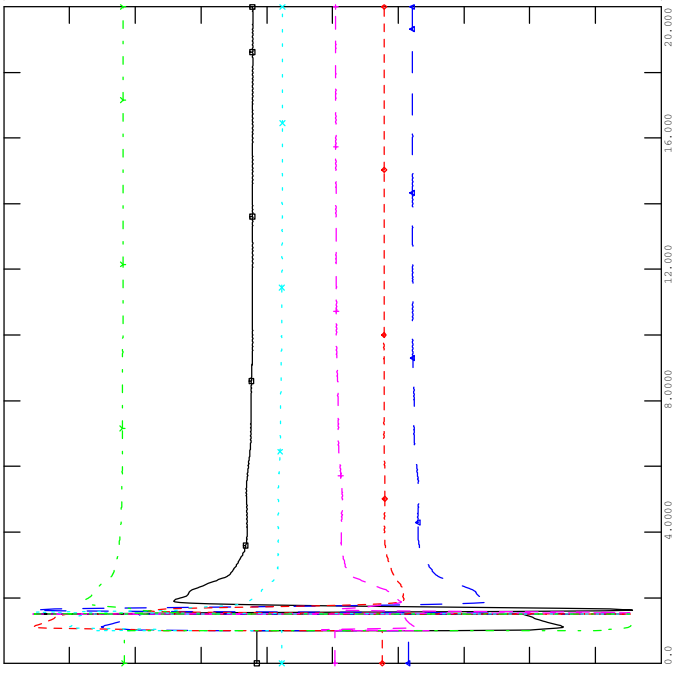
CHNL# 40: [VARS 669 TO 547004 CKT '74']
51.477 -77.41

CHNL# 38: [VARS 662 TO 720 CKT '64']
11.379 -12.48

CHNL# 36: [VARS 669 TO 720 CKT '64']
64.647 -18.00

CHNL# 34: [VARS 477 TO 662 CKT '83']
57.243 3.6008

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-3.601 -57.24



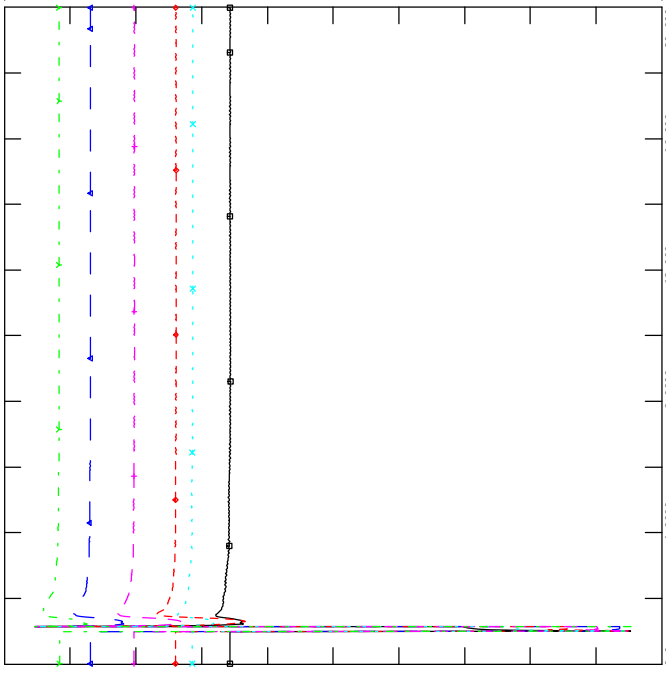
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0957 0.19450
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1278 0.87480
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1780 0.54840
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2519 0.50060
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1300 0.33910
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0860 0.89780



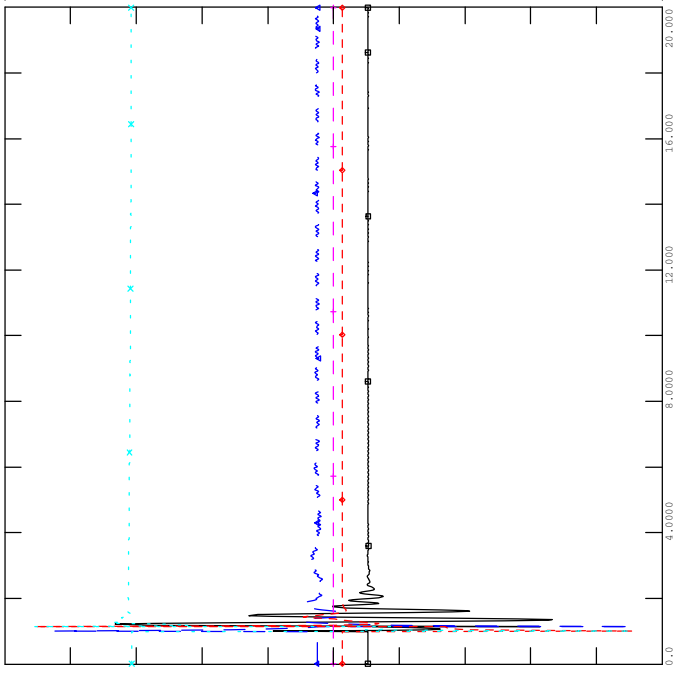
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3923 0.44730
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.2712 0.82450
CHNL# 6: [POWR 773[SECST 20.000]1] 0.84470 0.32540
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.35180 0.05340



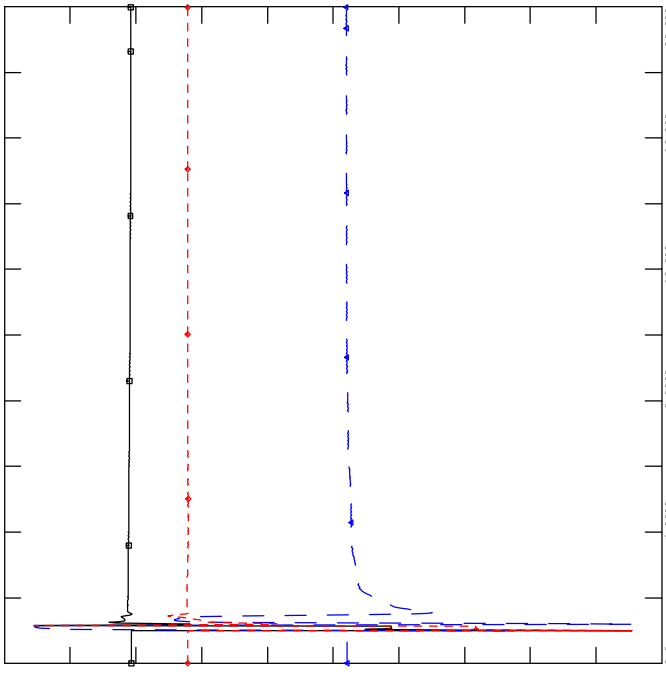
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2260 0.55800
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.4708 0.16600
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.3923 0.44730



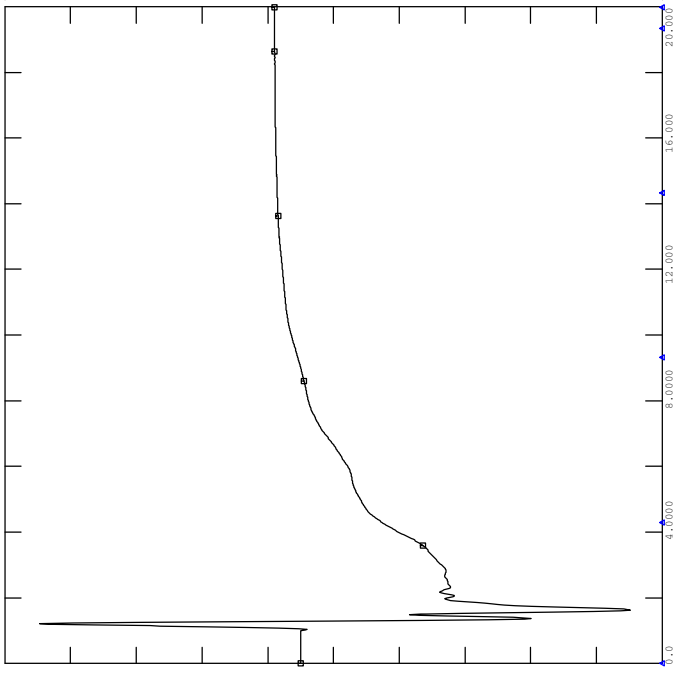
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -38.27 -40.33
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -2.203 -12.29



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
402.83 72.923

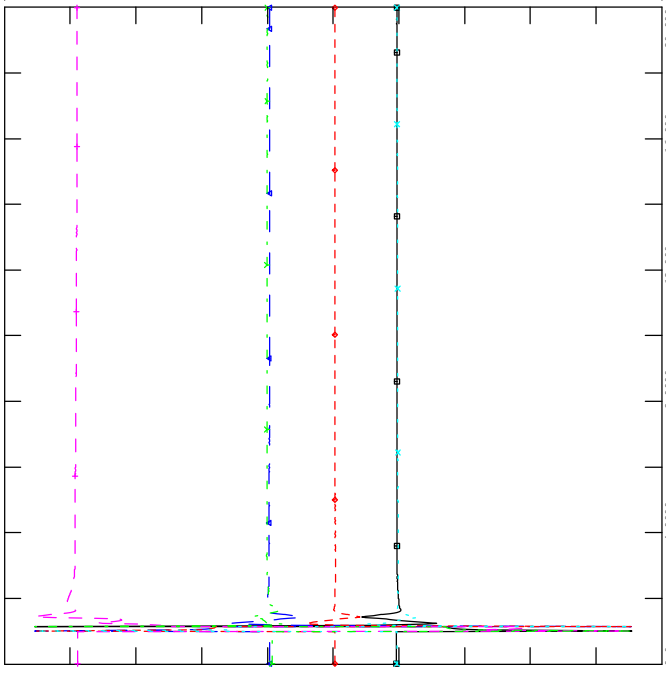
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-113.7 -507.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
47.527 7.2999

CHNL# 35: [POWR 669 TO 720 CKT '64']
-87.80 -381.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
-69.09 -276.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
276.50 69.093



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

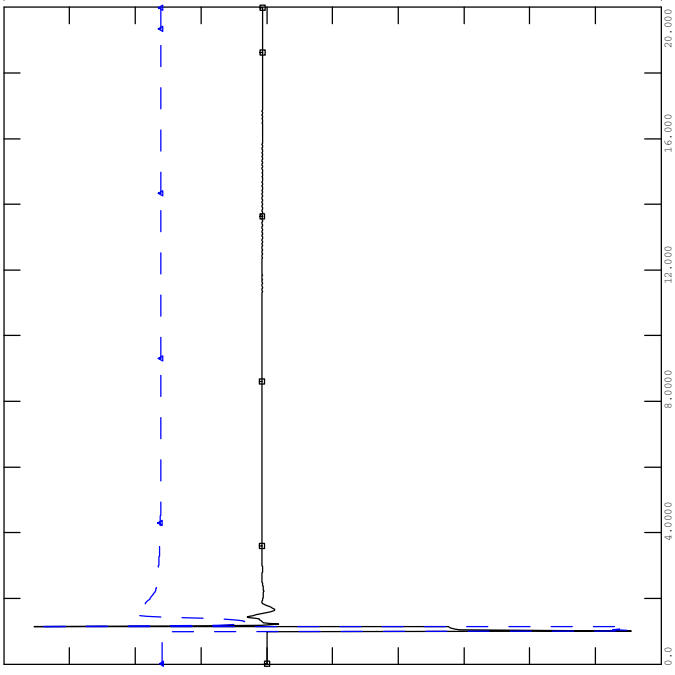
FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
65.048 -236.4

CHNL# 43: [POWR 669 TO 1012 CKT '35']
425.91 82.792



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

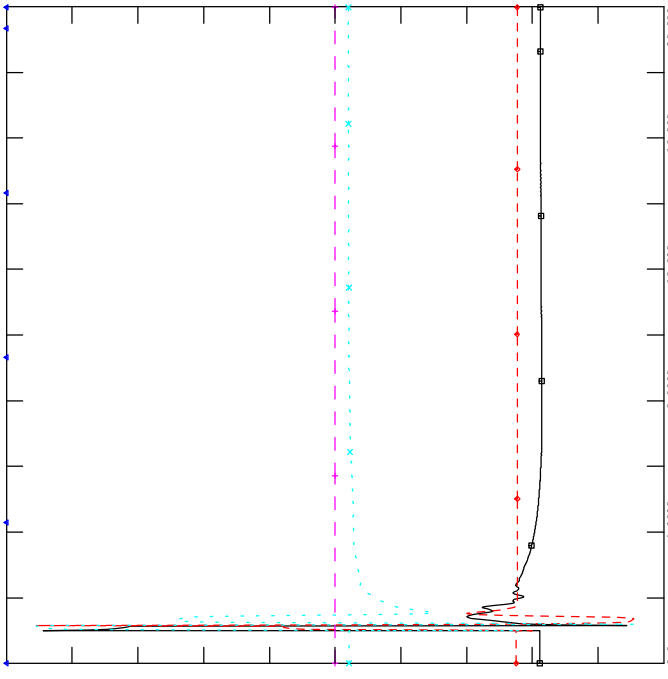
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.4708 0.16600

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.6123 -0.3525

CHNL# 11: [VARS 773[SECST 20.000]1]
0.24070 -0.3913

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.79850 -0.0950



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_16_600L_BULLSHEAD

FILE: Scn4_SL_16_600L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
54.836 -238.0

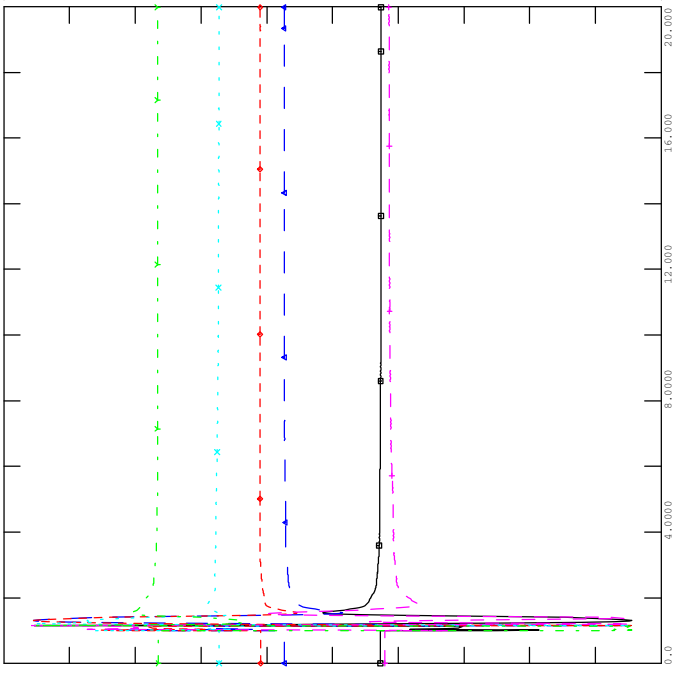
CHNL# 40: [VARS 669 TO 547004 CKT '74']
57.613 -127.5

CHNL# 38: [VARS 662 TO 720 CKT '64']
16.297 -12.90

CHNL# 36: [VARS 669 TO 720 CKT '64']
80.031 -81.12

CHNL# 34: [VARS 477 TO 662 CKT '83']
89.714 -63.61

CHNL# 32: [VARS 477 TO 547004 CKT '74']
63.610 -89.71



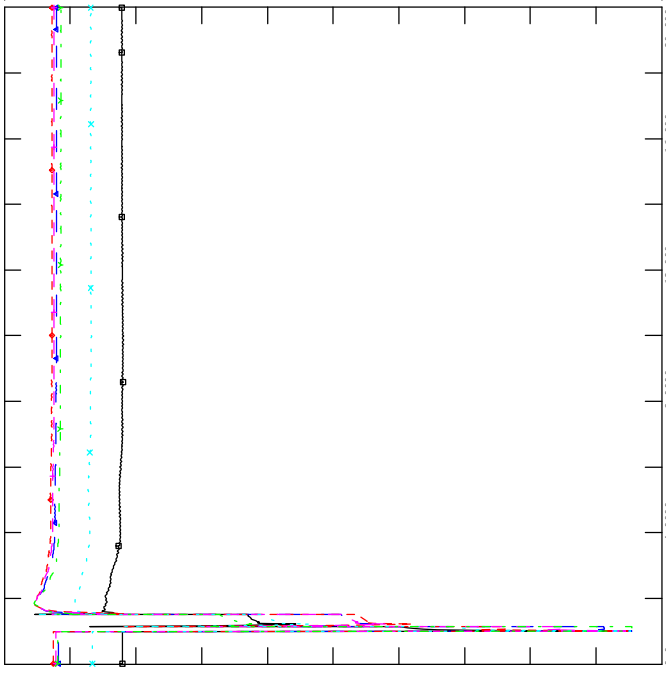
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1148 -0.0493
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0883 0.84250
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1035 0.46690
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1086 0.40570
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0975 0.23140
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0534 0.87600



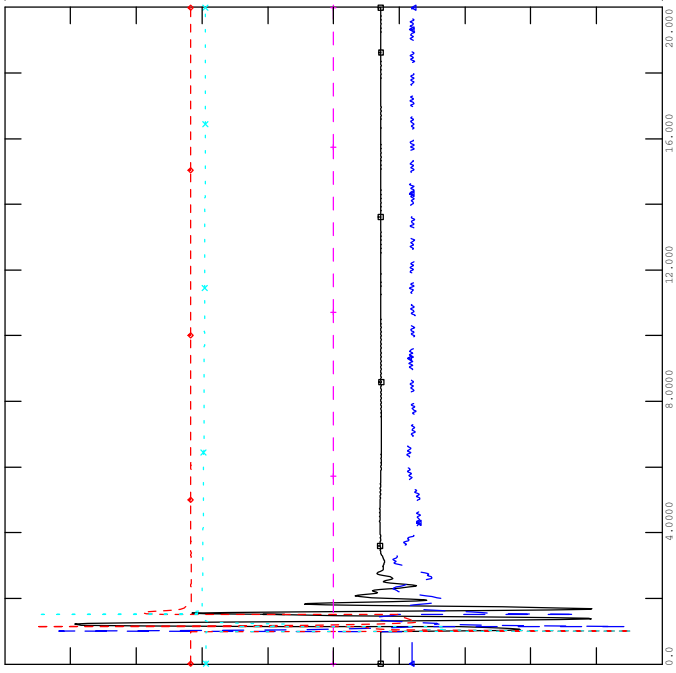
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8394 0.15120
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5685 0.61550
CHNL# 6: [POWR 773[SECST 20.000]1] 0.87620 0.42730
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.45530 -0.0138



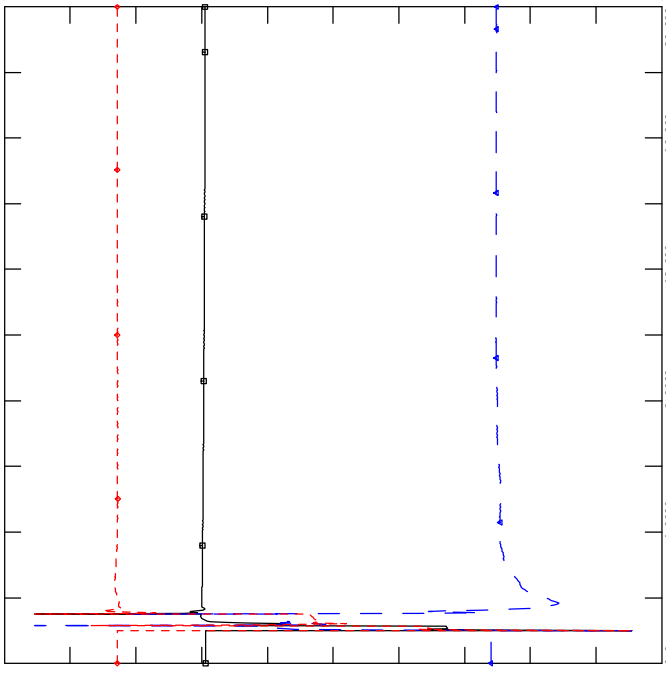
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1561 0.48020
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.1789 0.30300
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.8394 0.15120



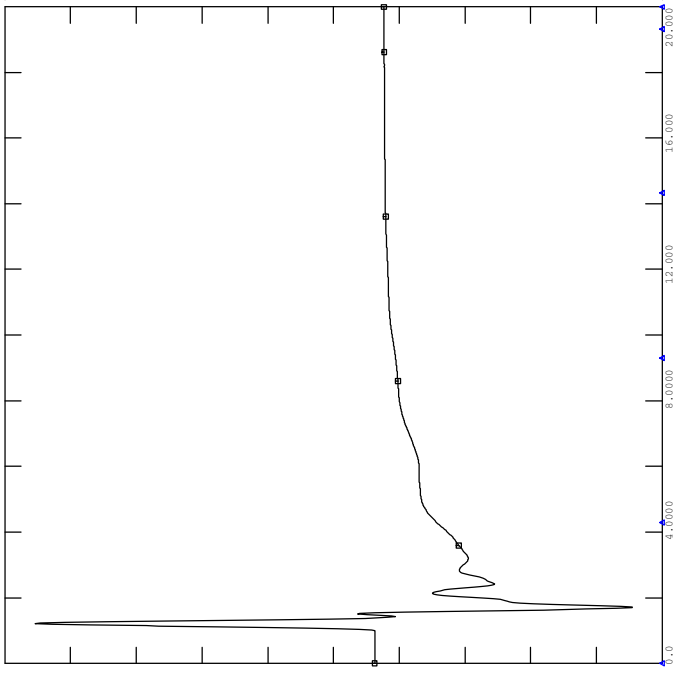
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.41 -40.54
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 13.995 -22.88



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
335.83 53.107

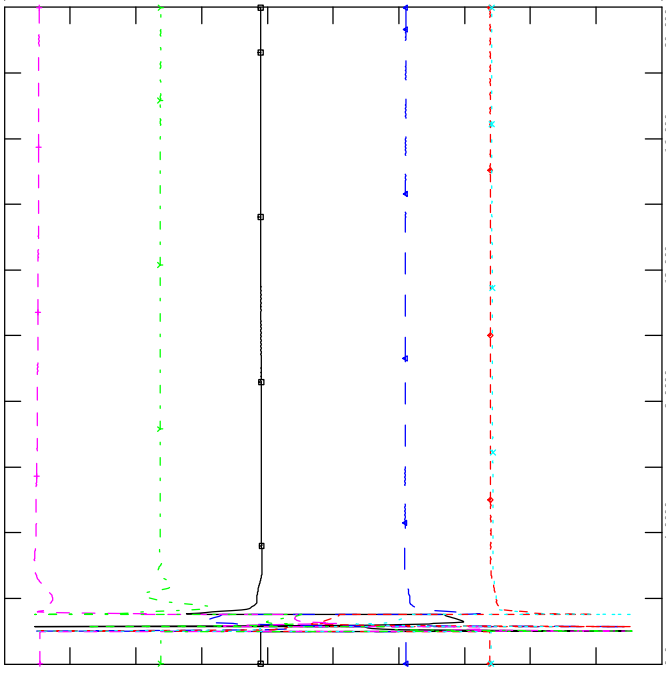
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-73.69 -444.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.489 0.45680

CHNL# 35: [POWR 669 TO 720 CKT '64']
-63.99 -296.2

CHNL# 33: [POWR 477 TO 662 CKT '83']
-54.62 -215.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
215.36 54.624



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

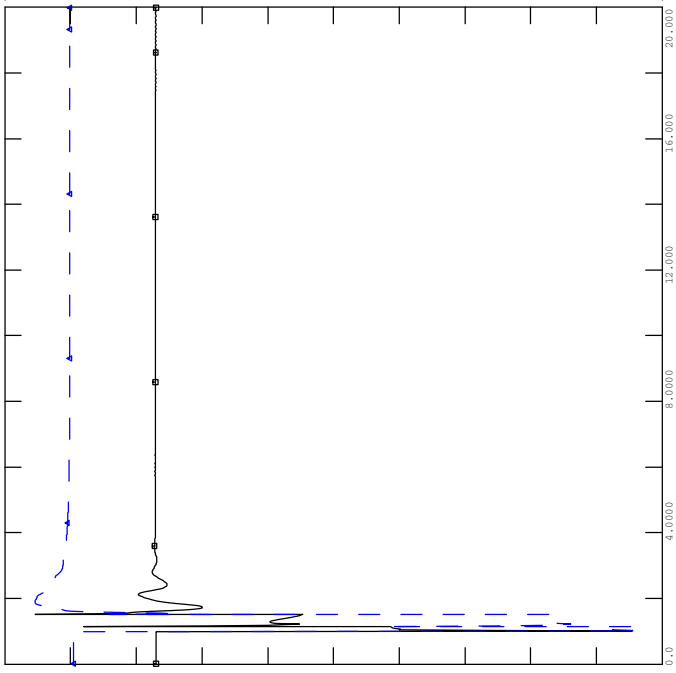
FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
19.064 -234.2

CHNL# 43: [POWR 669 TO 1012 CKT '35']
356.49 61.485



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

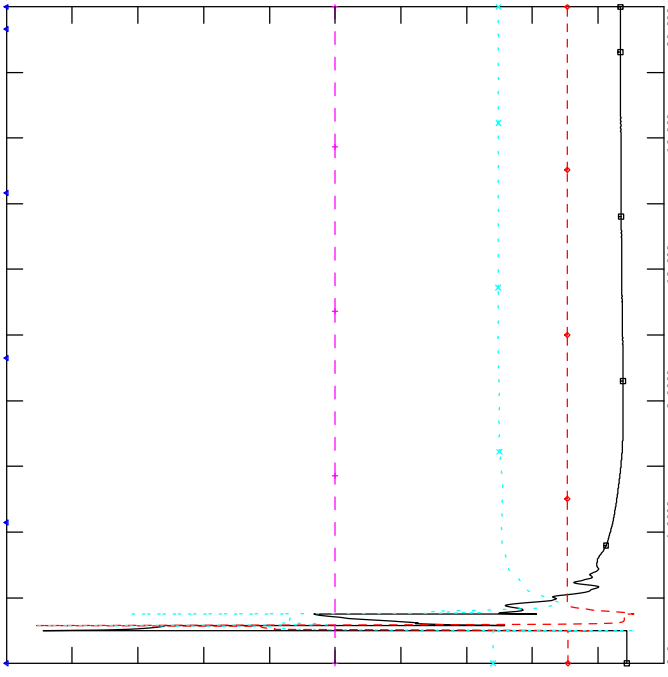
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
2.1789 0.30300

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.4240 -0.1395

CHNL# 11: [VARS 773[SECST 20.000]1]
0.31080 -0.2553

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.91270 0.02400



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_17_880L_ALR

FILE: Scn4_SL_17_880L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
12.109 -237.1

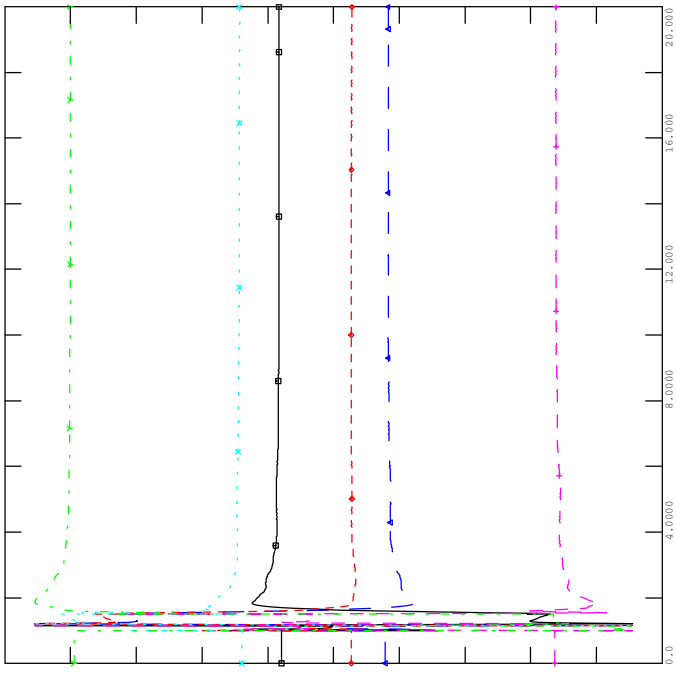
CHNL# 40: [VARS 669 TO 547004 CKT '74']
73.115 -138.2

CHNL# 38: [VARS 662 TO 720 CKT '64']
25.090 -5.669

CHNL# 36: [VARS 669 TO 720 CKT '64']
105.11 -62.03

CHNL# 34: [VARS 477 TO 662 CKT '83']
100.70 -31.39

CHNL# 32: [VARS 477 TO 547004 CKT '74']
31.388 -100.7



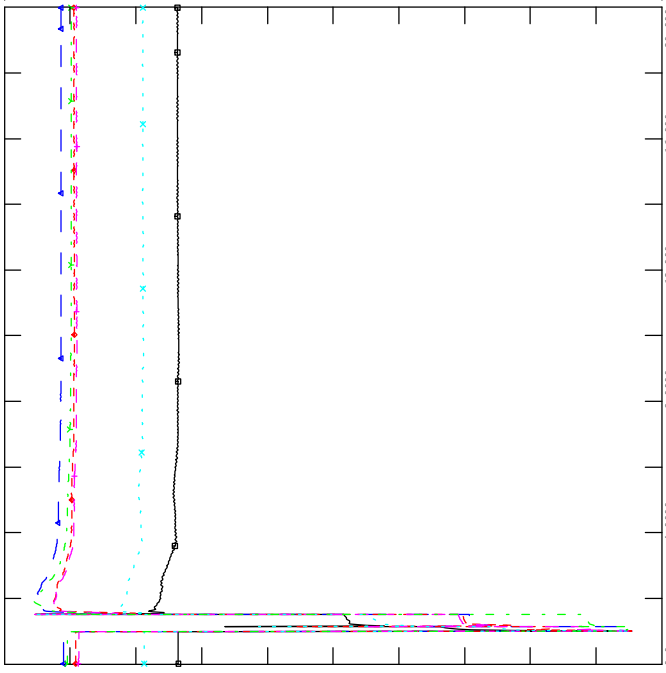
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1085 0.18790
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1045 0.87450
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1181 0.54780
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1235 0.50280
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0944 0.33640
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0660 0.89780



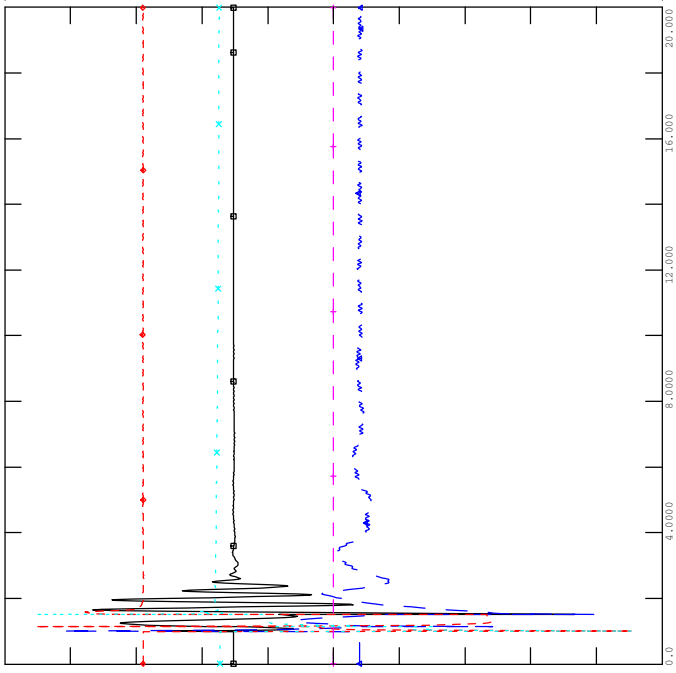
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.7946 0.41600
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.3234 0.86050
CHNL# 6: [POWR 773[SECST 20.000]1] 0.84590 0.38680
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.31610 -0.0551



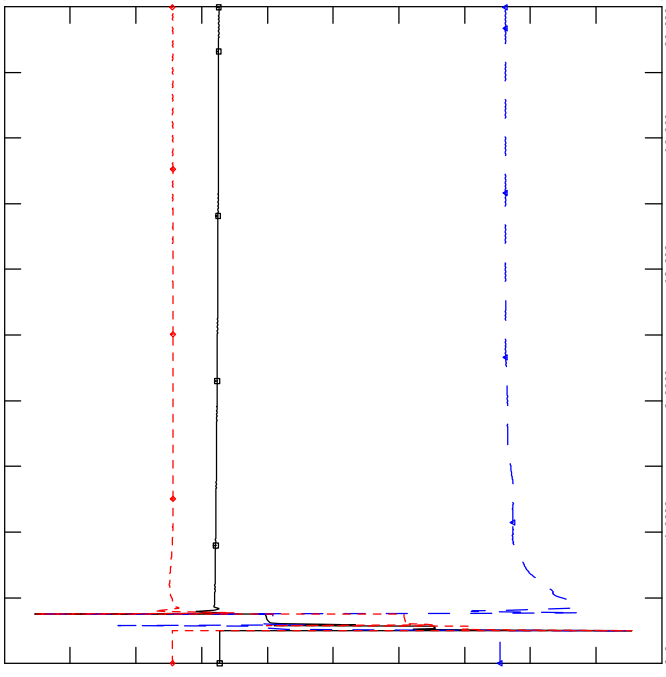
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2065 0.55570
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 2.0885 0.36660
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.7946 0.41600



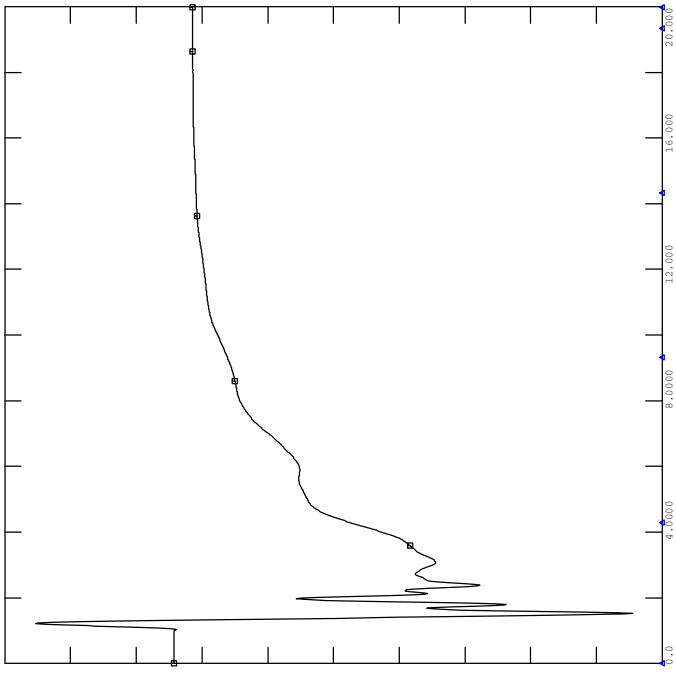
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.37 -40.69
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -1.811 -20.97



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
307.05 76.603

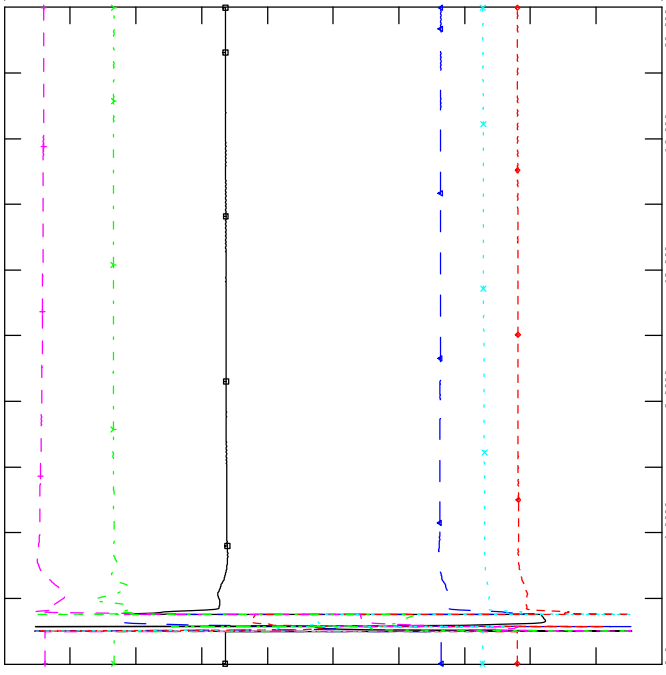
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-115.3 -436.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.420 7.1134

CHNL# 35: [POWR 669 TO 720 CKT '64']
-91.74 -276.0

CHNL# 33: [POWR 477 TO 662 CKT '83']
-72.43 -193.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
193.40 72.429



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

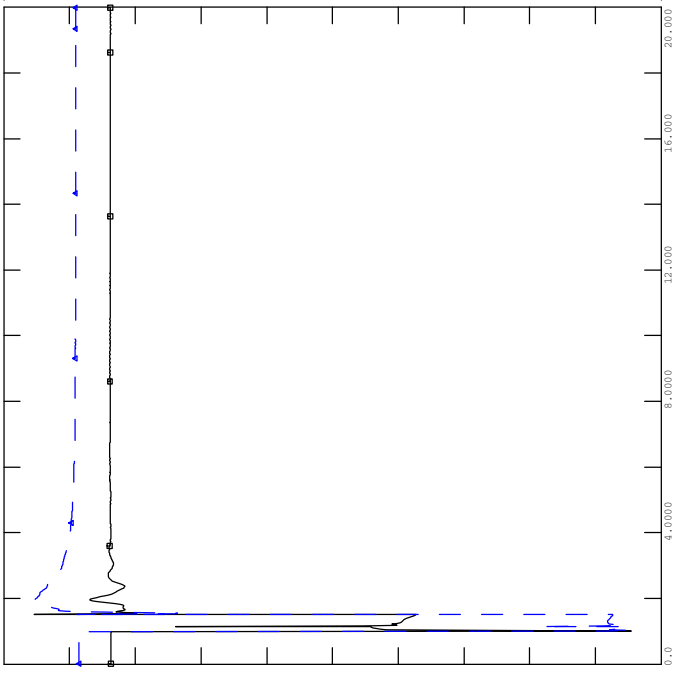
FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
21.788 -234.5

CHNL# 43: [POWR 669 TO 1012 CKT '35']
327.97 86.510



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

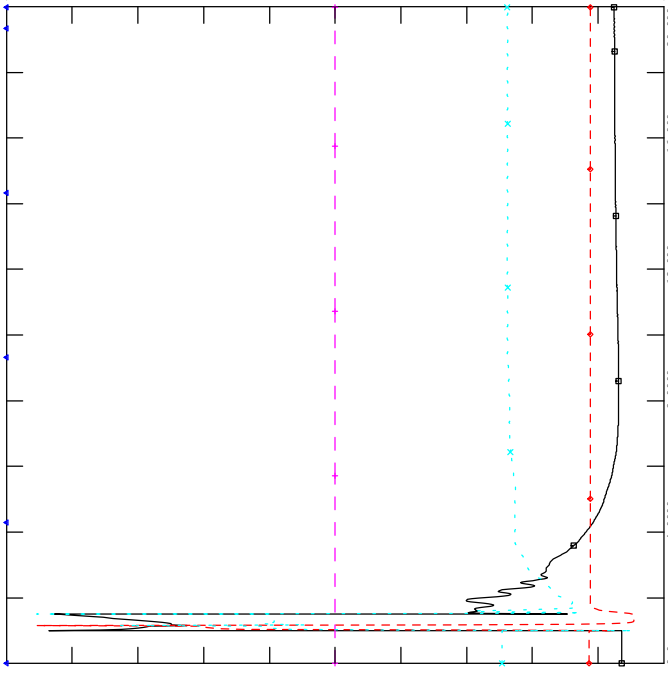
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
2.0885 0.36660

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.1478 -0.0478

CHNL# 11: [VARS 773[SECST 20.000]1]
0.24360 -0.2920

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.80190 0.02400



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_18_880L_BULLSHEAD

FILE: Scn4_SL_18_880L_Bullshead.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
14.571 -236.2

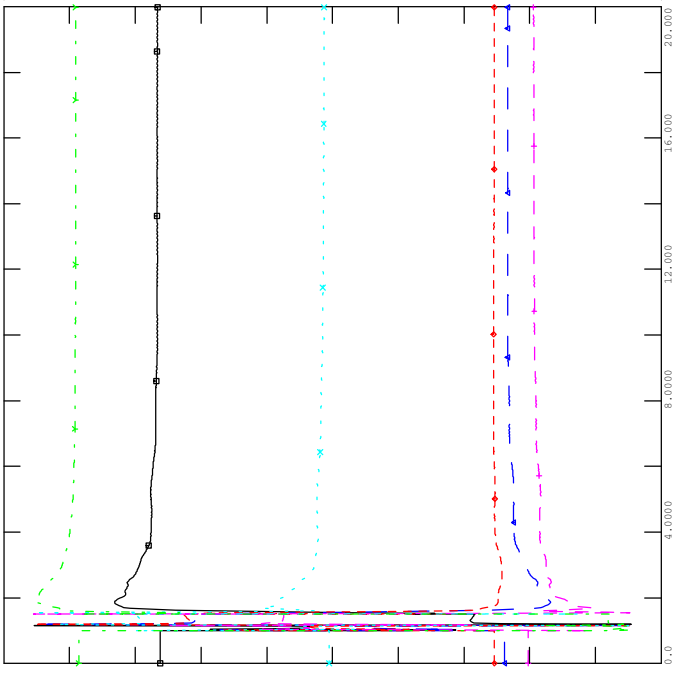
CHNL# 40: [VARS 669 TO 547004 CKT '74']
55.960 -63.36

CHNL# 38: [VARS 662 TO 720 CKT '64']
25.652 -7.323

CHNL# 36: [VARS 669 TO 720 CKT '64']
87.881 -6.968

CHNL# 34: [VARS 477 TO 662 CKT '83']
86.575 4.7701

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-4.770 -86.57



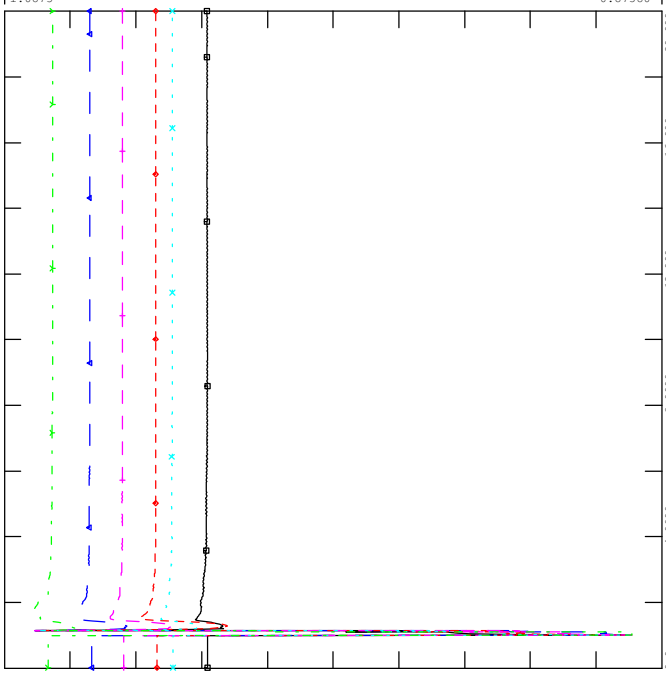
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0961 -0.0482
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1300 0.83970
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1855 0.46100
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2555 0.39620
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1487 0.22640
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0875 0.87380



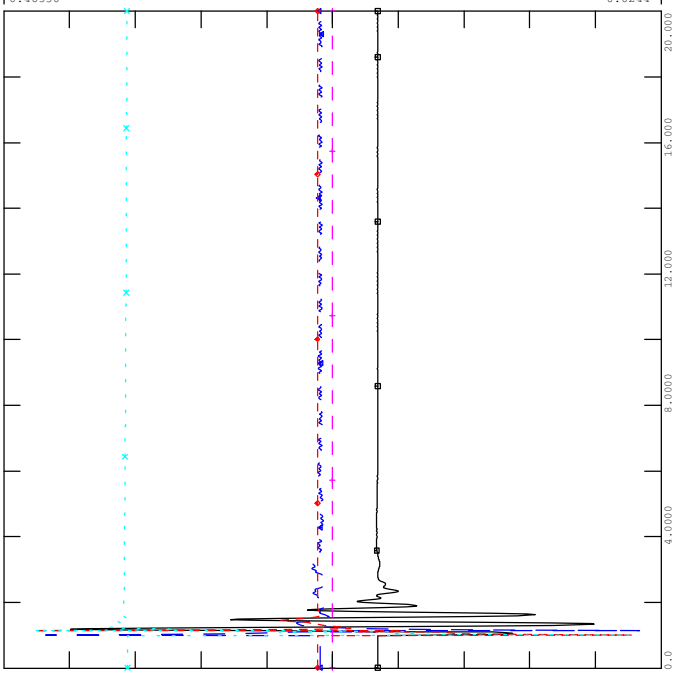
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.4448 0.16410
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 3.3320 0.57270
CHNL# 6: [POWR 773[SECST 20.000]1] 0.87690 0.29750
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.46550 -0.0244



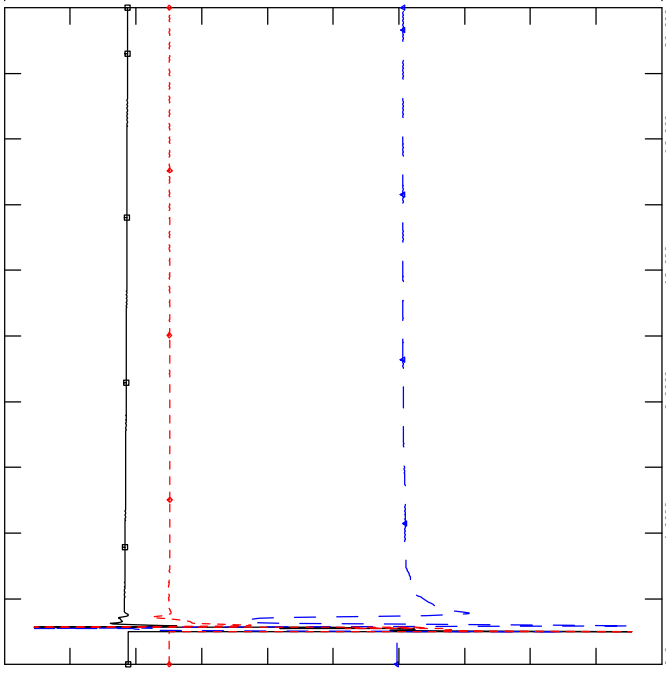
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2294 0.47470
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7136 0.16720
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.4448 0.16410



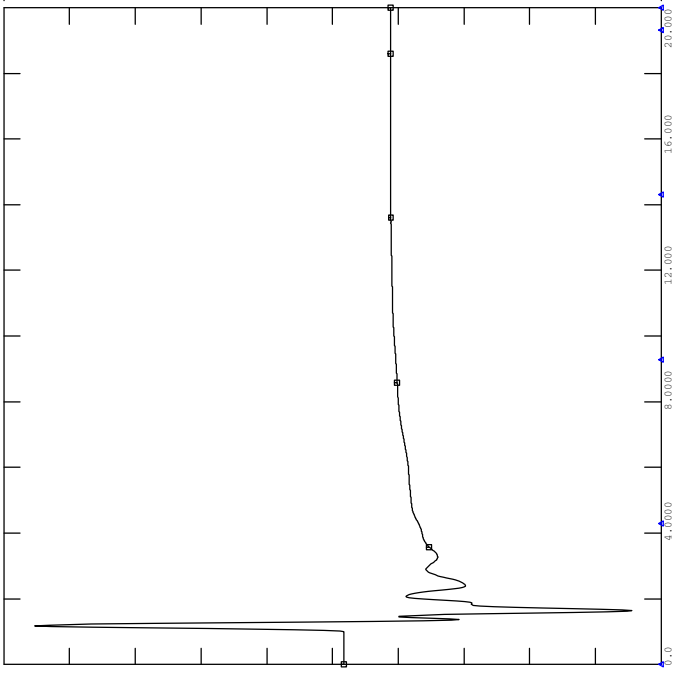
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -38.28 -40.41
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 7.6533 -20.16



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
428.71 48.246

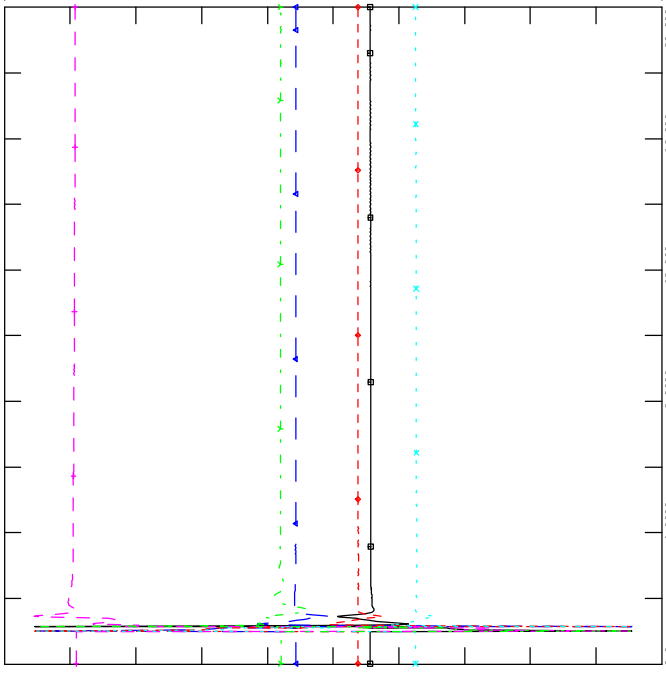
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-69.28 -515.9

CHNL# 37: [POWR 662 TO 720 CKT '64']
48.282 0.15780

CHNL# 35: [POWR 669 TO 720 CKT '64']
-58.94 -387.3

CHNL# 33: [POWR 477 TO 662 CKT '83']
-51.05 -280.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
280.35 51.050



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

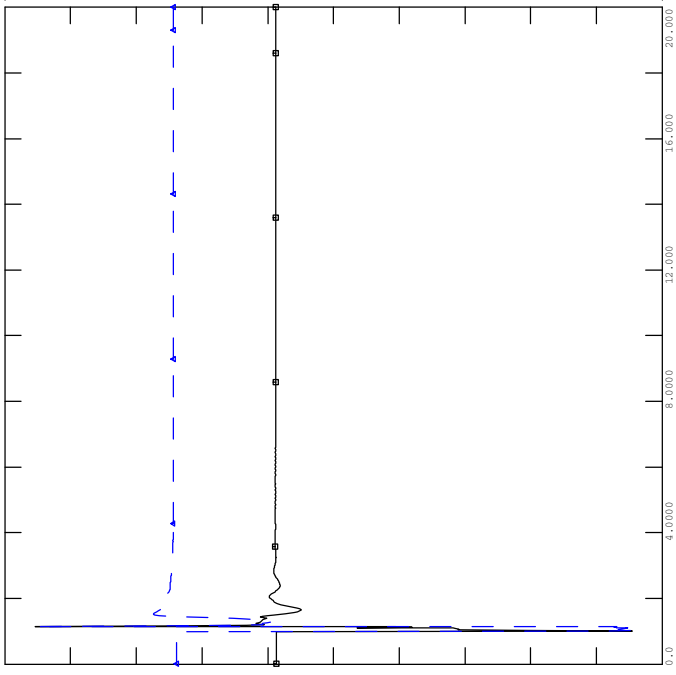
FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
73.671 -236.6

CHNL# 43: [POWR 669 TO 1012 CKT '35']
451.81 56.469



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

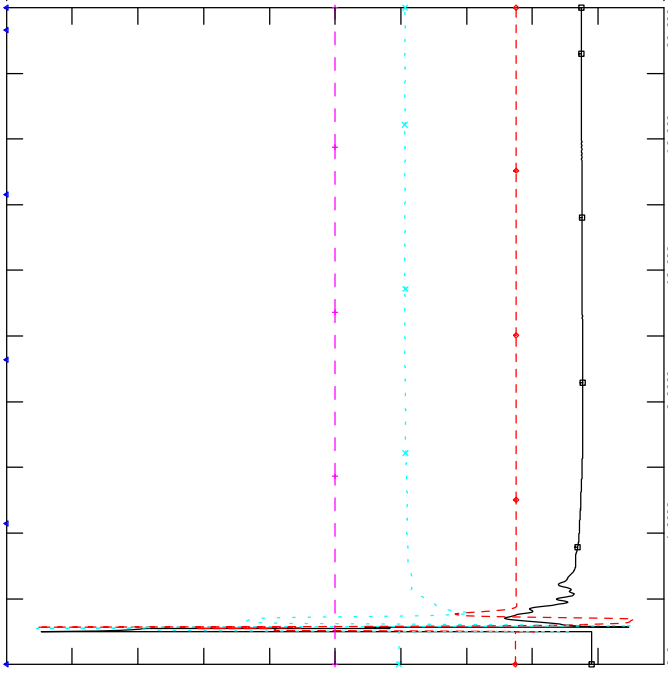
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.7136 0.16720

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
1.5688 -0.3446

CHNL# 11: [VARS 773[SECST 20.000]1]
0.31250 -0.3841

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.91250 -0.0298



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_19_675L_ALR

FILE: Scn4_SL_19_675L_AlR.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
63.003 -238.1

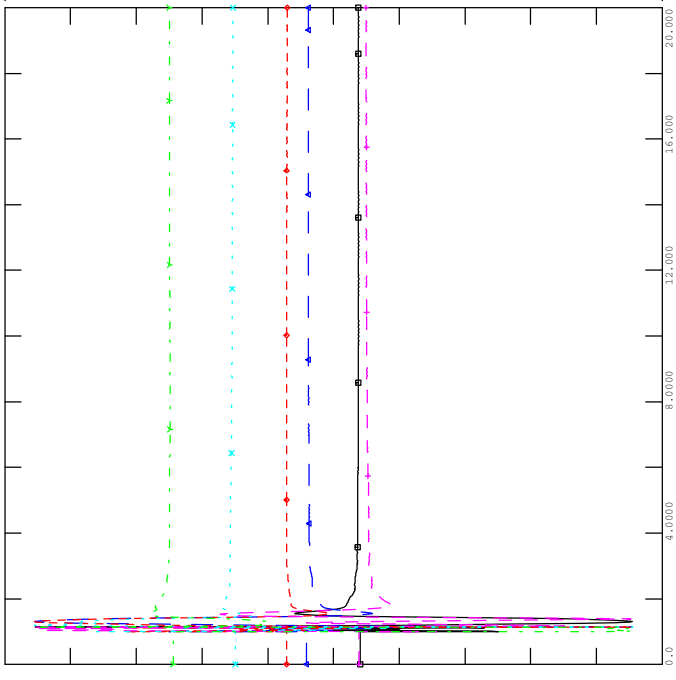
CHNL# 40: [VARS 669 TO 547004 CKT '74']
58.681 -117.2

CHNL# 38: [VARS 662 TO 720 CKT '64']
15.971 -14.86

CHNL# 36: [VARS 669 TO 720 CKT '64']
84.234 -72.35

CHNL# 34: [VARS 477 TO 662 CKT '83']
92.970 -56.77

CHNL# 32: [VARS 477 TO 547004 CKT '74']
56.770 -92.97



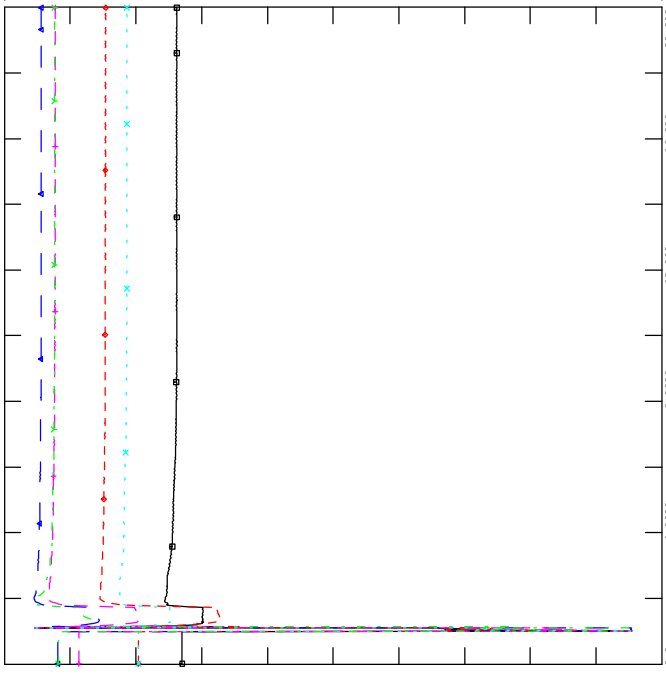
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.1010 0.11250
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.1325 0.75530
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.1558 0.25320
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.2914 0.13900
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.1215 -0.0475
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0979 0.81540



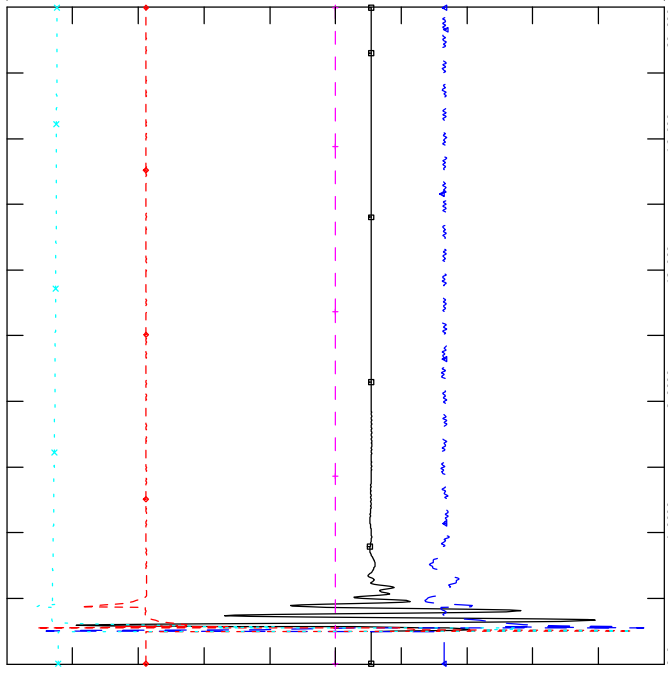
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1949 -0.1045
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.5430 0.05660
CHNL# 6: [POWR 773[SECST 20.000]1] 0.95050 0.42090
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.45090 -0.0253



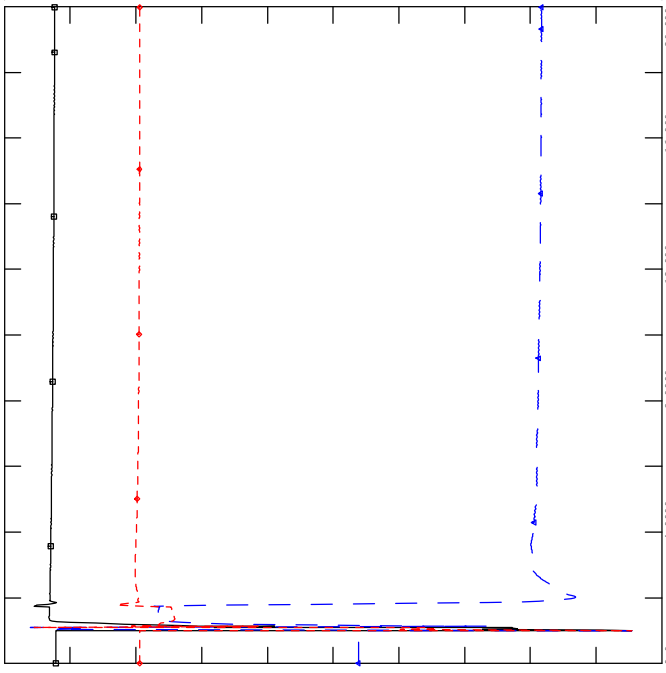
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.2386 0.27250
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.4947 0.18710
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1949 -0.1045



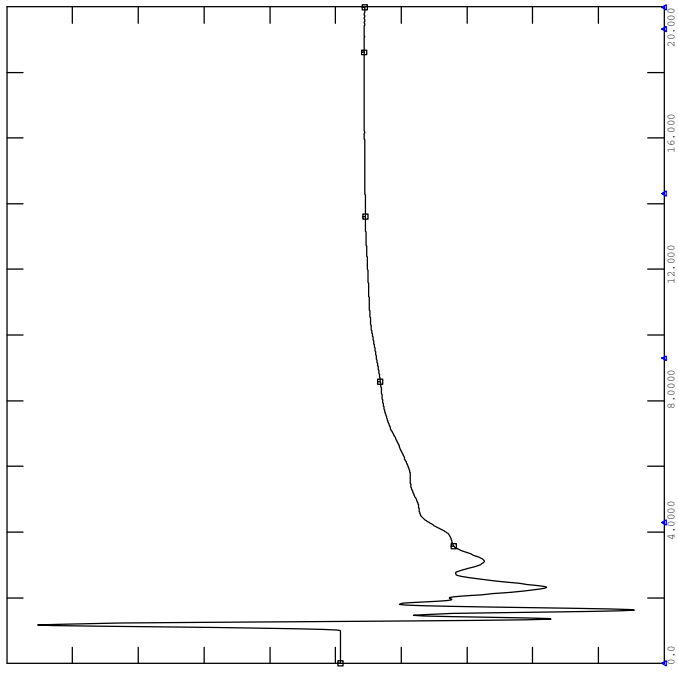
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.88 -41.19
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 3.7029 -16.88



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
308.35 -17.57

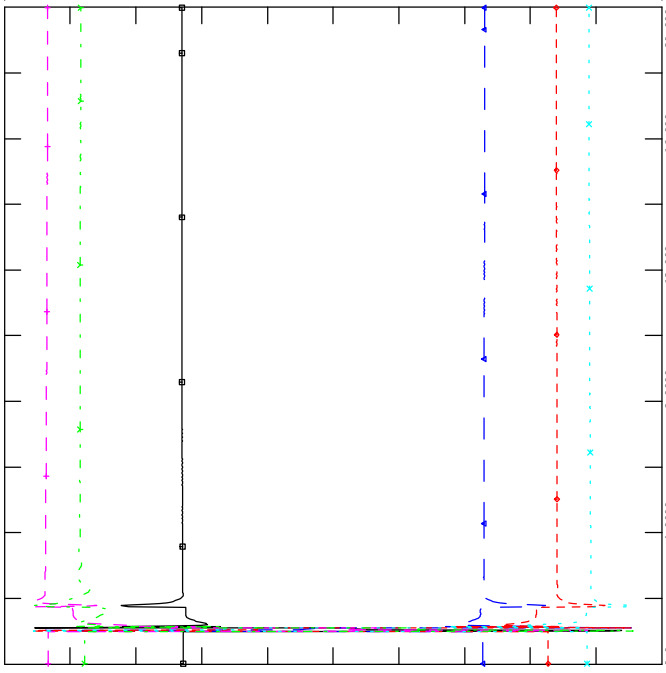
CHNL# 39: [POWR 669 TO 547004 CKT '74']
15.024 -395.4

CHNL# 37: [POWR 662 TO 720 CKT '64']
48.244 -30.24

CHNL# 35: [POWR 669 TO 720 CKT '64']
13.255 -287.3

CHNL# 33: [POWR 477 TO 662 CKT '83']
20.720 -217.6

CHNL# 31: [POWR 477 TO 547004 CKT '74']
217.63 -20.76



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

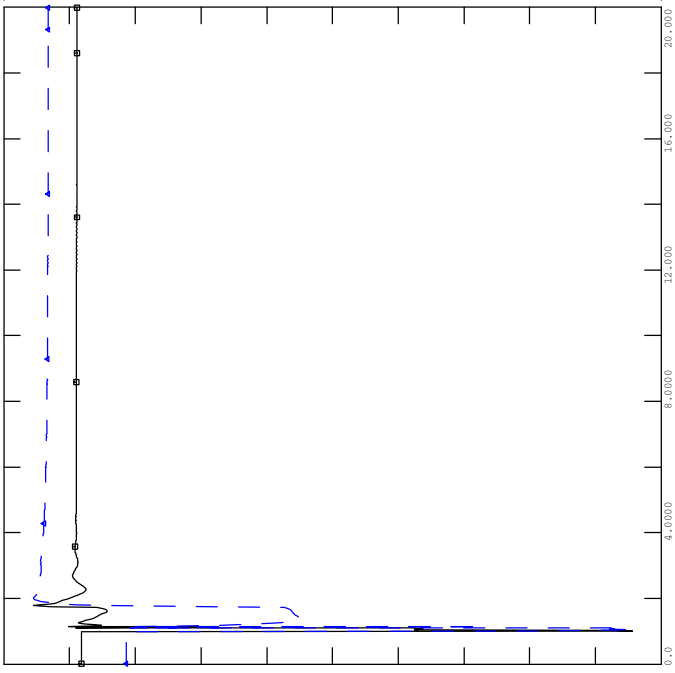
FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
41.014 -219.9

CHNL# 43: [POWR 669 TO 1012 CKT '35']
329.15 -13.04



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

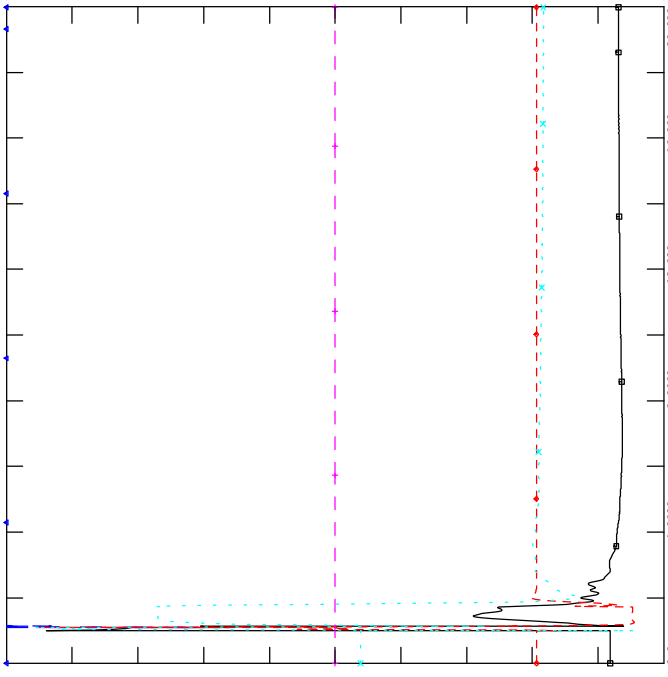
CHNL# 14: [VARS60003[P2122_GEN 0.6900]G1]
1.4947 0.18710

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
2.2485 -0.4304

CHNL# 11: [VARS 773[SECST 20.000]1]
0.47350 -0.4942

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.83340 0.00620



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_20_675L_BOWMANTON

FILE: Scn4_SL_20_675L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
33.527 -221.6

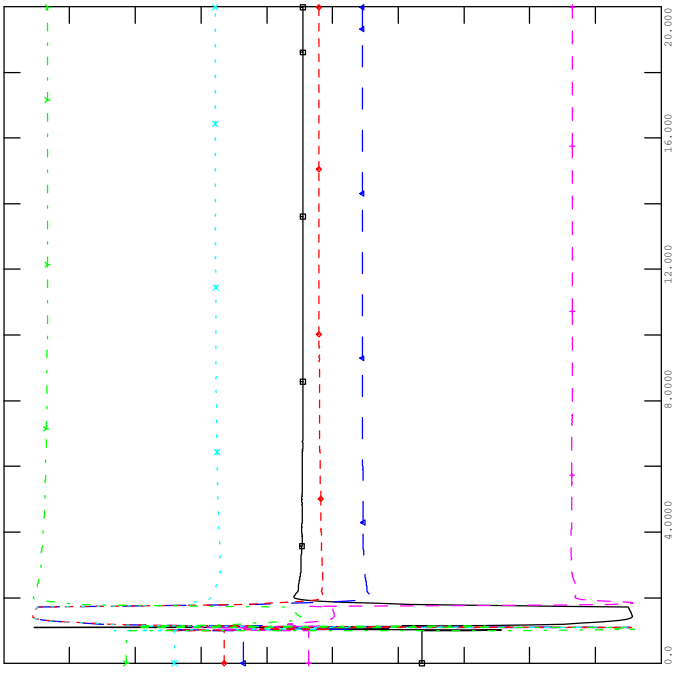
CHNL# 40: [VARS 669 TO 547004 CKT '74']
86.395 -258.6

CHNL# 38: [VARS 662 TO 720 CKT '64']
47.000 -55.73

CHNL# 36: [VARS 669 TO 720 CKT '64']
125.83 -199.0

CHNL# 34: [VARS 477 TO 662 CKT '83']
127.70 -156.3

CHNL# 32: [VARS 477 TO 547004 CKT '74']
156.29 -127.7



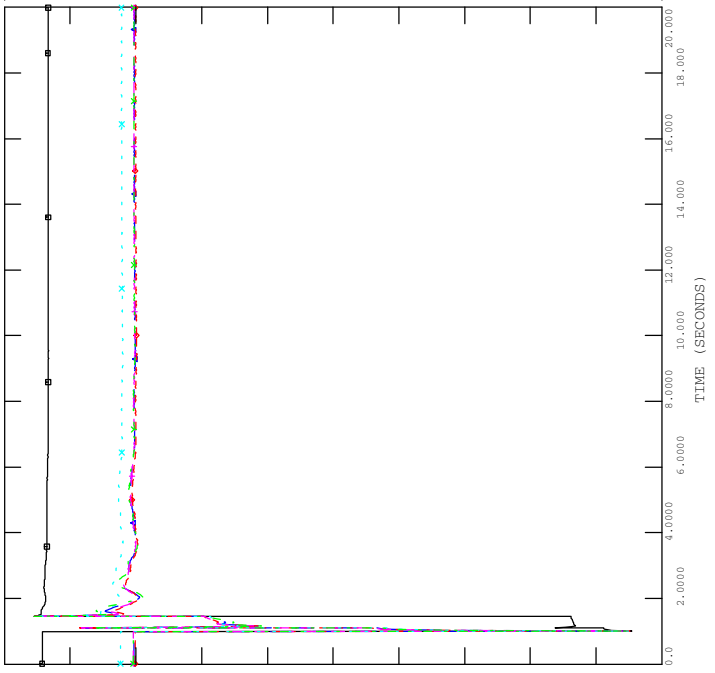
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0354 0.95690
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0750 0.96470
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0757 0.96390
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0800 0.96010
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0451 0.94930
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.0454 0.62850



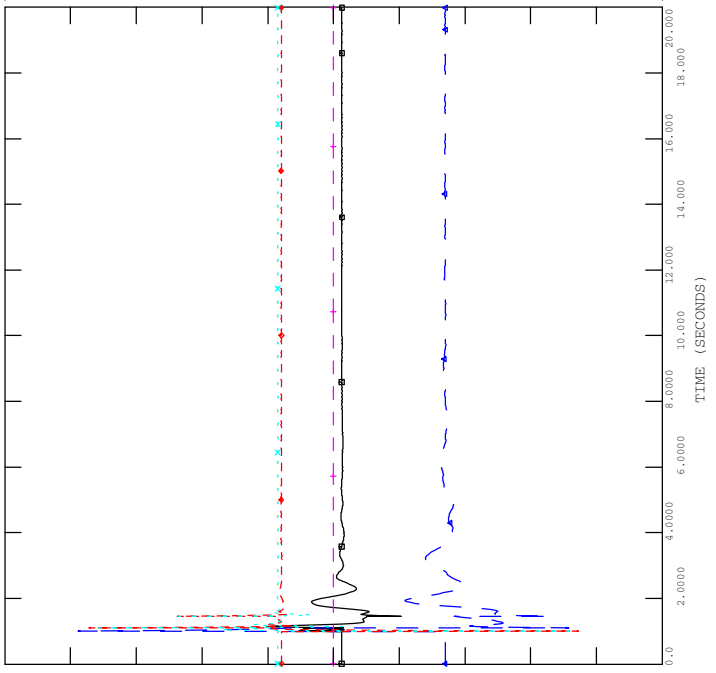
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1639 1.8078
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.1833 1.7855
CHNL# 6: [POWR 773[SECST 20.000]1] 0.83500 0.48110
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.25140 0.12580



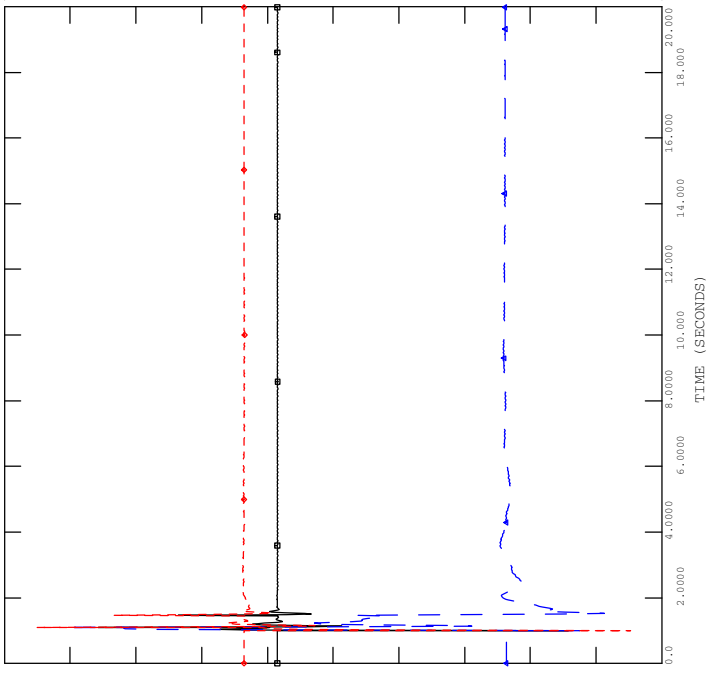
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0904 0.95210
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2152 0.65900
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1639 1.8078



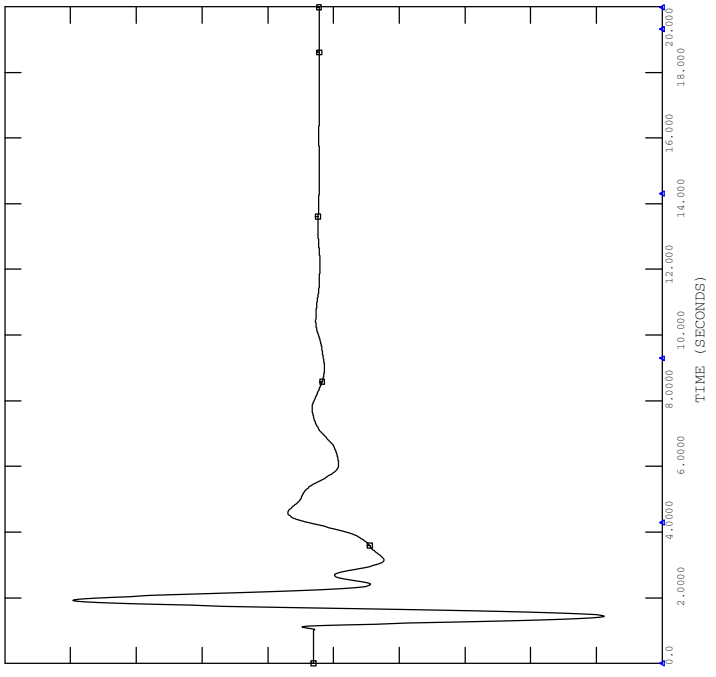
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.39 -41.11
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -4.122 -9.710



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
285.79 246.59

CHNL# 39: [POWR 669 TO 547004 CKT '74']
-316.2 -369.5

CHNL# 37: [POWR 662 TO 720 CKT '64']
44.963 38.778

CHNL# 35: [POWR 669 TO 720 CKT '64']
-212.6 -249.4

CHNL# 33: [POWR 477 TO 662 CKT '83']
-137.6 -163.5

CHNL# 31: [POWR 477 TO 547004 CKT '74']
163.46 137.55

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
0.07340 -9.664

CHNL# 43: [POWR 669 TO 1012 CKT '35']
305.95 264.12

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2152 0.65900

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.14330 0.03050

CHNL# 11: [VARS 773[SECST 20.000]1]
0.16420 -0.3077

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.19140 0.01370

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_21_879L_BURDETT

FILE: Scn4_SL_21_879L_Burdett.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-2.664 -16.55

CHNL# 40: [VARS 669 TO 547004 CKT '74']
11.954 -23.74

CHNL# 38: [VARS 662 TO 720 CKT '64']
4.3287 -2.279

CHNL# 36: [VARS 669 TO 720 CKT '64']
26.702 14.563

CHNL# 34: [VARS 477 TO 662 CKT '83']
37.950 21.347

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-21.35 -37.95

TIME (SECONDS)
0.0 2.0000 4.0000 6.0000 8.0000 10.000 12.000 14.000 16.000 18.000 20.000

SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]]
1.0379 0.93250

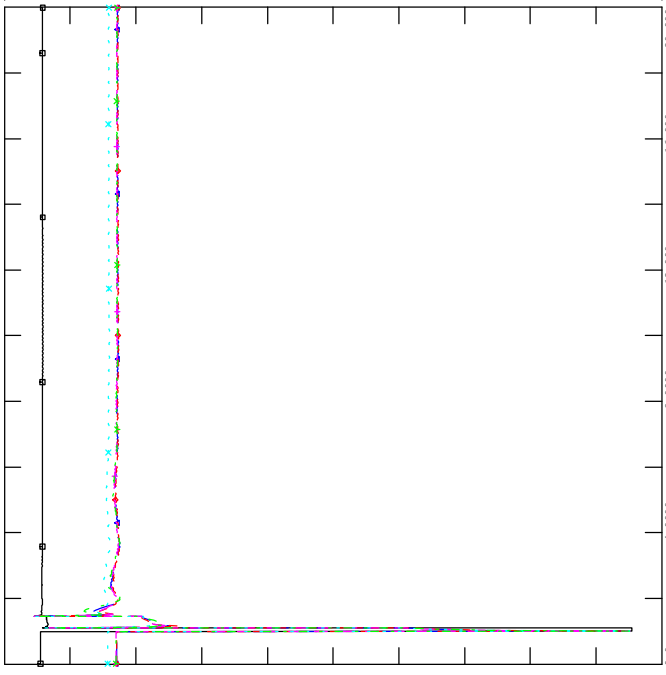
CHNL# 26: [VOLT 918 [CASS01 240.00]]
1.0790 0.92970

CHNL# 25: [VOLT 669 [BOWMAN1 240.00]]
1.0792 0.92920

CHNL# 24: [VOLT 662 [WHITLA1 240.00]]
1.0836 0.92280

CHNL# 23: [VOLT 659 [BOWMAN2 138.00]]
1.0482 0.91960

CHNL# 22: [VOLT 645 [BOWMAN3 138.00]]
1.0825 -0.0311



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

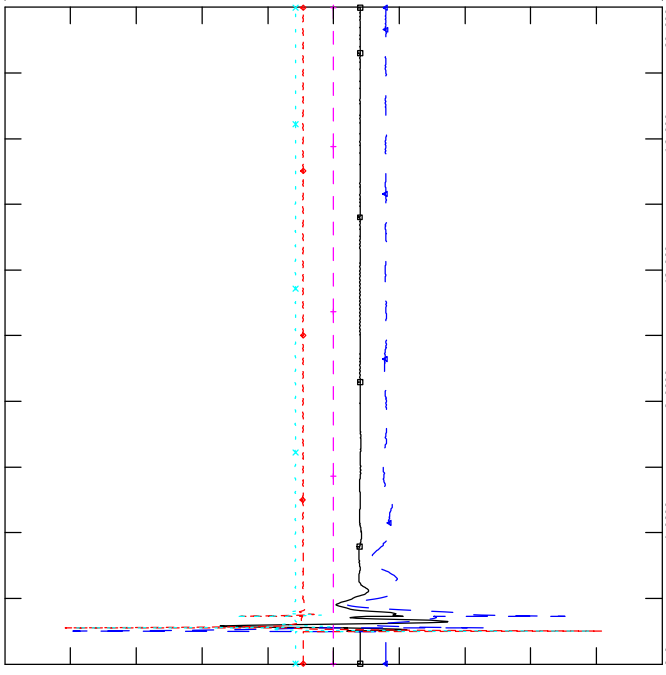
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.2301 1.7459

CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1]
2.2664 1.7144

CHNL# 6: [POWR 773[SECST 20.000]1]
0.82220 0.43520

CHNL# 5: [POWR 713[CMH 14 13.800]14]
0.26960 0.11670



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

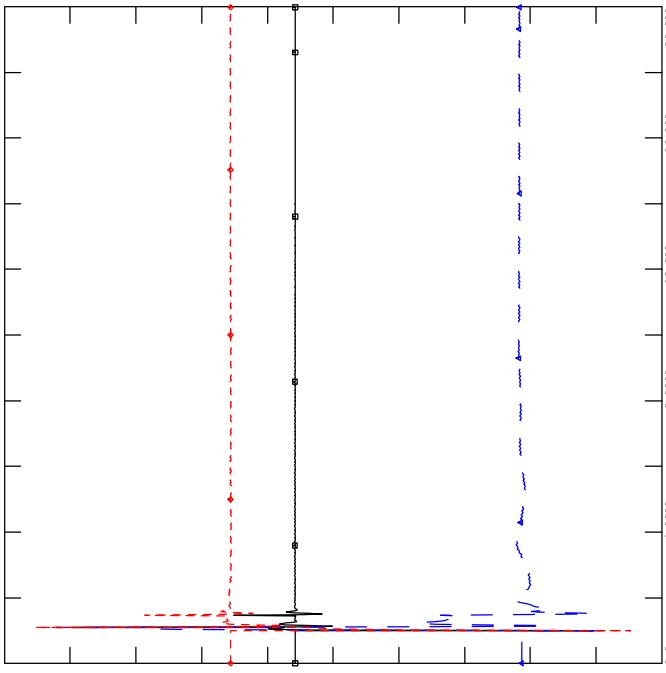
FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1]
1.1039 0.91800

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2921 0.65470

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1]
2.2301 1.7459



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

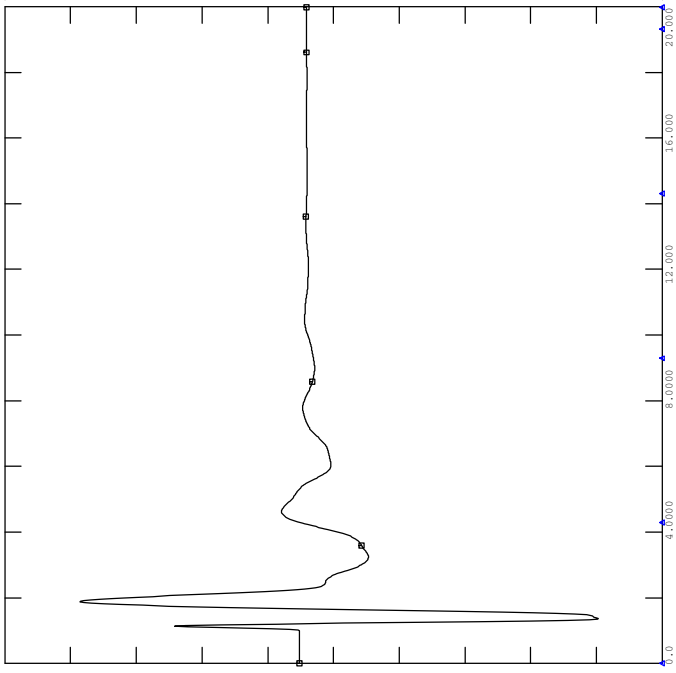
FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1]
-37.54 -41.00

CHNL# 1: [ANGL 713[CMH 14 13.800]14]
-4.520 -9.491



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
296.78 235.53

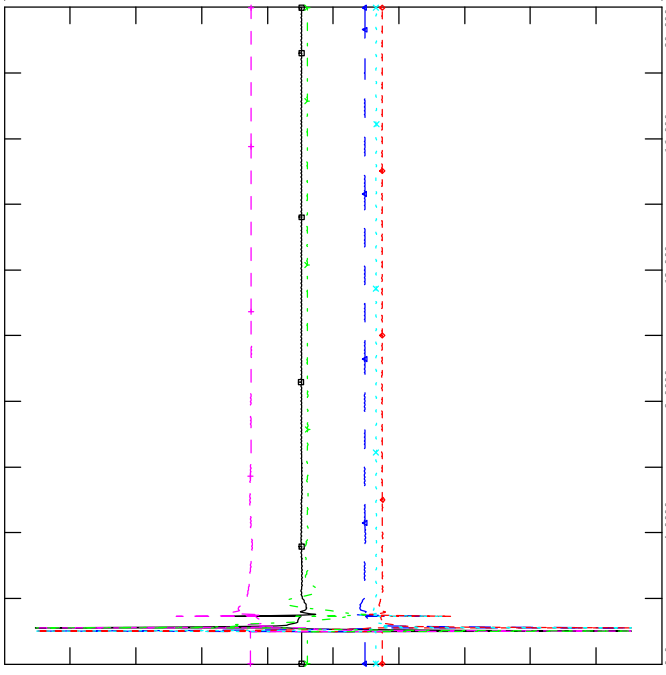
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-303.3 -383.3

CHNL# 37: [POWR 662 TO 720 CKT '64']
46.628 37.053

CHNL# 35: [POWR 669 TO 720 CKT '64']
-203.4 -259.0

CHNL# 33: [POWR 477 TO 662 CKT '83']
-131.4 -170.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
170.39 131.43



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

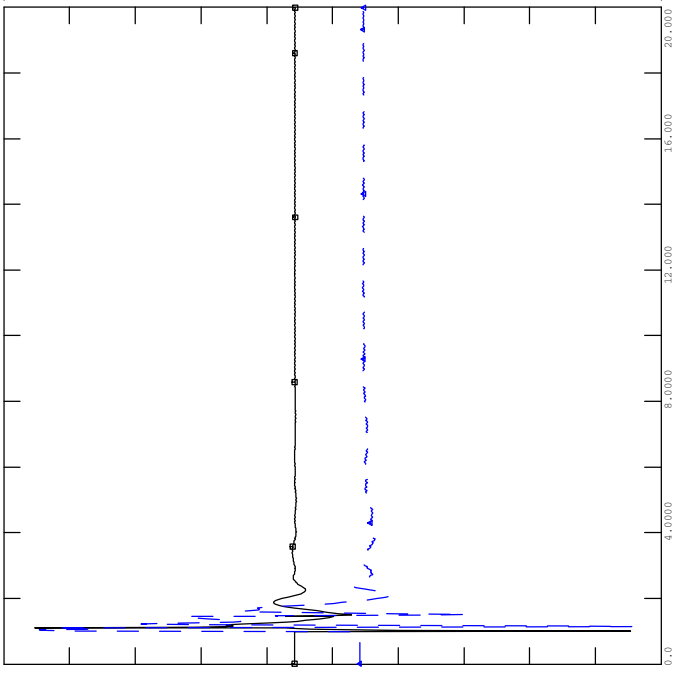
FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-3.151 -11.13

CHNL# 43: [POWR 669 TO 1012 CKT '35']
317.43 252.20



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

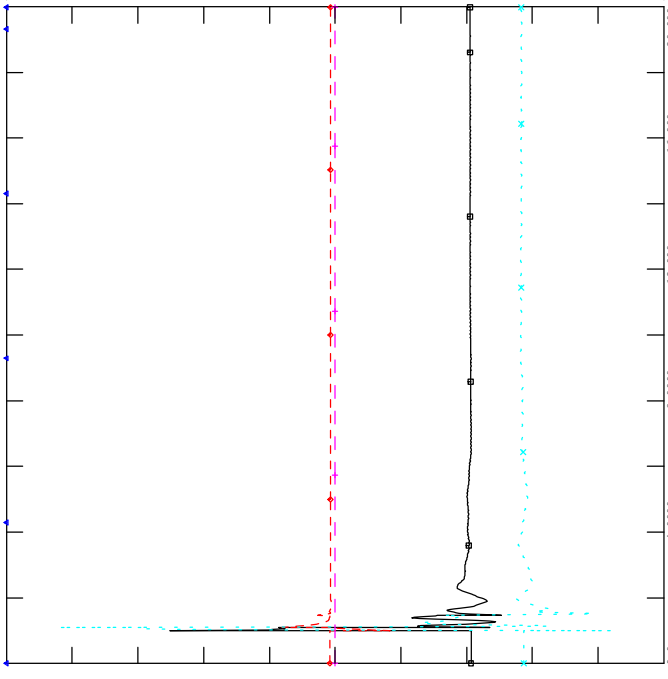
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2921 0.65470

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.14730 0.02740

CHNL# 11: [VARS 773[SECST 20.000]1]
0.18170 -0.2724

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.21710 0.01450



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_22_879L_BOWMANTON

FILE: Scn4_SL_22_879L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-4.393 -17.94

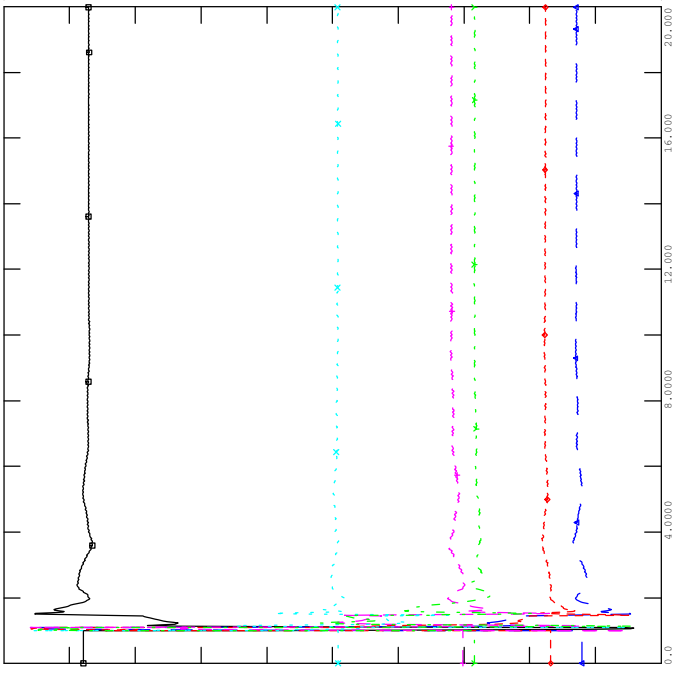
CHNL# 40: [VARS 669 TO 547004 CKT '74']
17.233 -22.68

CHNL# 38: [VARS 662 TO 720 CKT '64']
4.3641 -2.802

CHNL# 36: [VARS 669 TO 720 CKT '64']
32.445 13.982

CHNL# 34: [VARS 477 TO 662 CKT '83']
44.391 21.474

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-21.47 -44.39



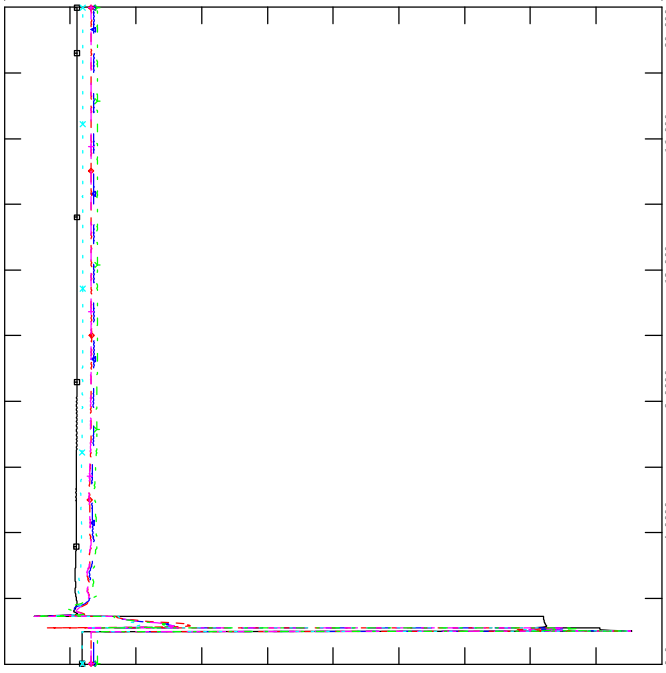
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0545 0.81000
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0959 0.75540
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0990 0.75520
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.1052 0.73370
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0664 0.77070
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1196 0.28900



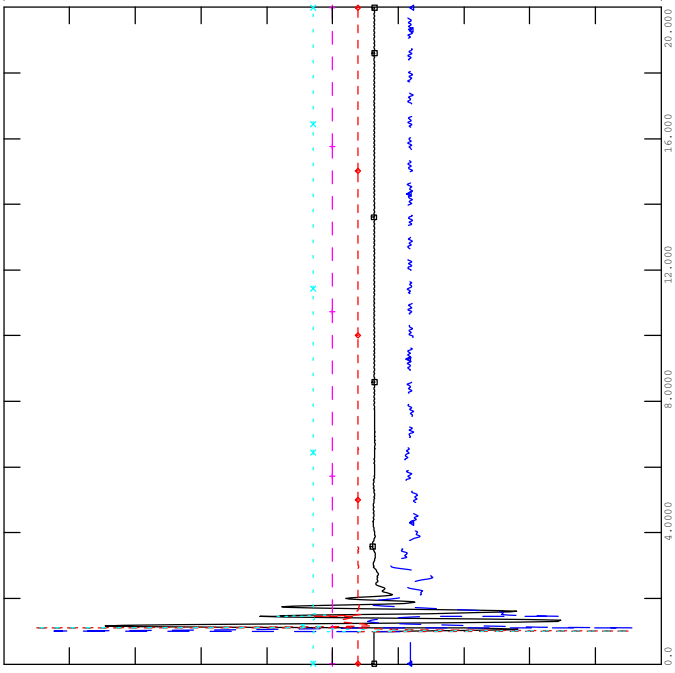
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6540 1.2988
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.8159 1.3315
CHNL# 6: [POWR 773[SECST 20.000]1] 0.88290 0.42190
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.37050 0.04480



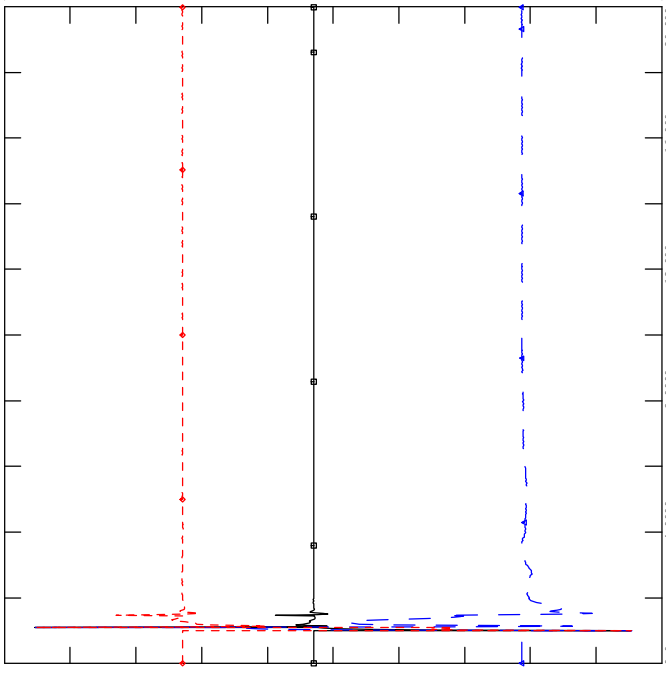
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.1482 0.74830
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7682 0.52640
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.6540 1.2988



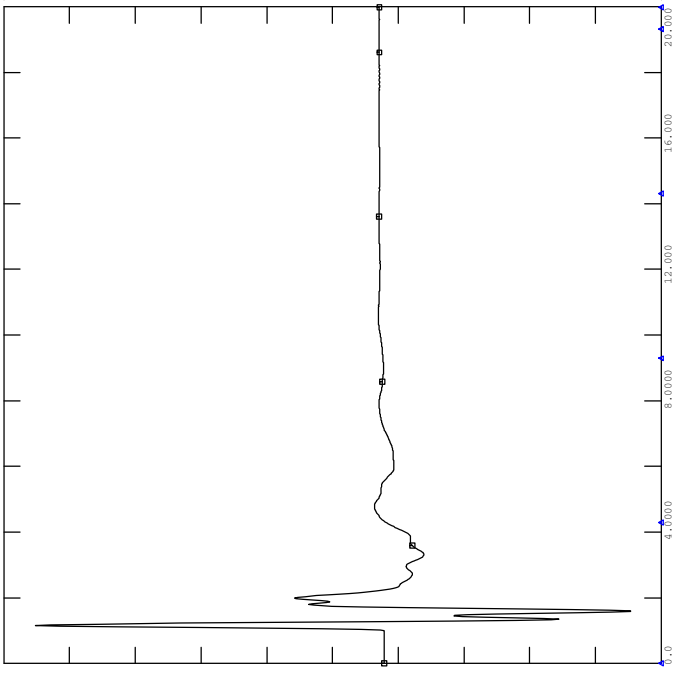
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -37.34 -40.83
CHNL# 1: [ANGL 713[CMH 14 13.800]14] 0.40620 -11.95



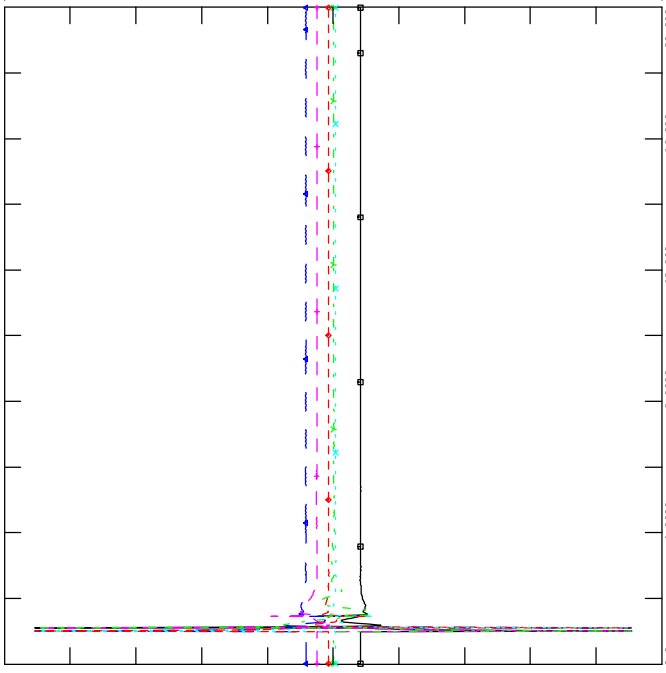
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34'] 364.48 172.90
CHNL# 39: [POWR 669 TO 547004 CKT '74'] -227.3 -468.0
CHNL# 37: [POWR 662 TO 720 CKT '64'] 58.717 25.759
CHNL# 35: [POWR 669 TO 720 CKT '64'] -153.9 -319.3
CHNL# 33: [POWR 477 TO 662 CKT '83'] -101.8 -213.0
CHNL# 31: [POWR 477 TO 547004 CKT '74'] 213.00 101.82



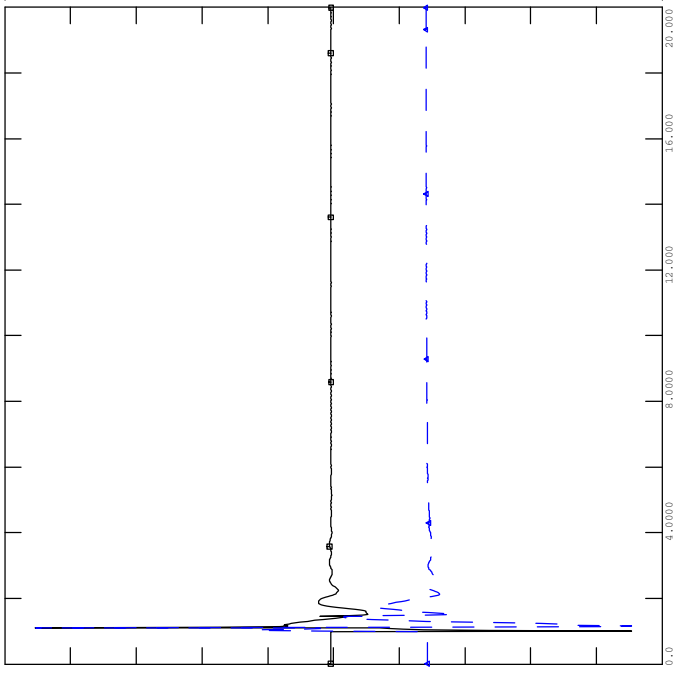
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35'] 21.187 -23.38
CHNL# 43: [POWR 669 TO 1012 CKT '35'] 389.51 186.12



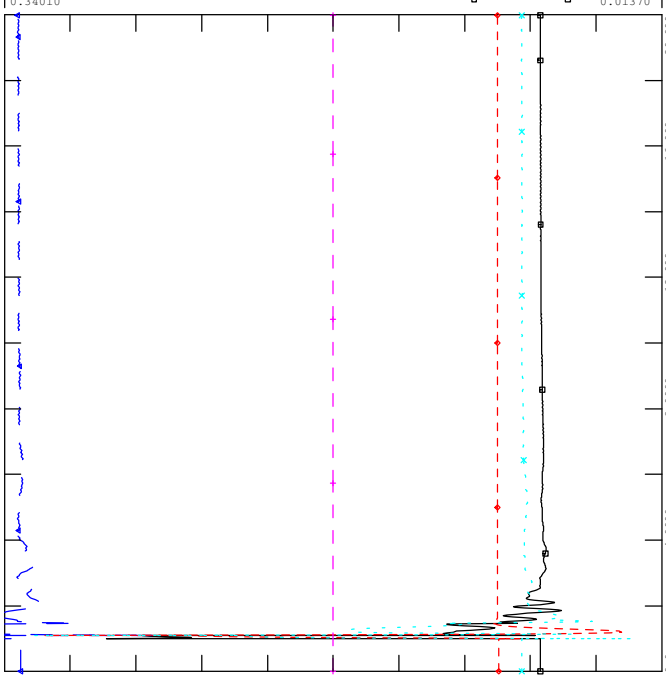
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.7682 0.52640
CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1] 0.69970 -0.1135
CHNL# 11: [VARS 773[SECST 20.000]1] 0.53980 -0.3606
CHNL# 10: [VARS 713[CMH 14 13.800]14] 0.34010 0.01370



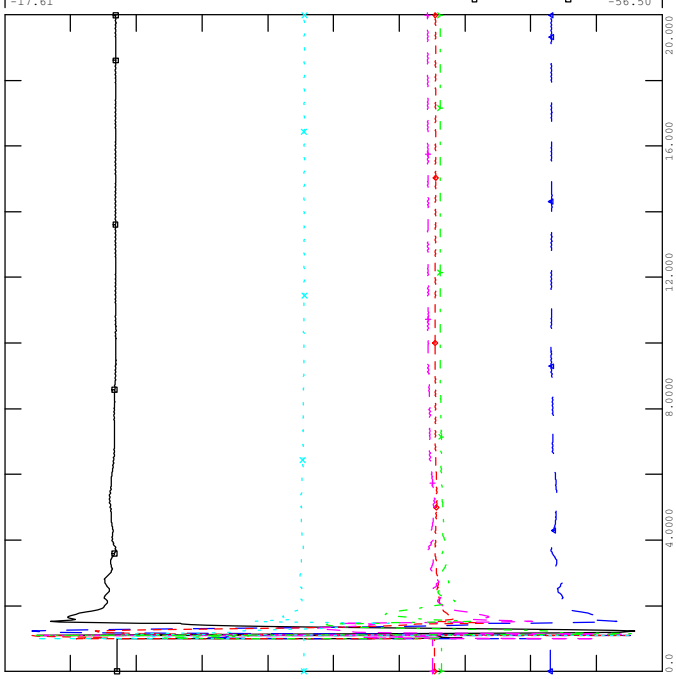
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_23_658L_CYPRESS

FILE: Scn4_SL_23_658L_Cypress.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34'] 13.734 -28.15
CHNL# 40: [VARS 669 TO 547004 CKT '74'] 37.905 -52.21
CHNL# 38: [VARS 662 TO 720 CKT '64'] 8.3689 -5.475
CHNL# 36: [VARS 669 TO 720 CKT '64'] 49.114 0.10770
CHNL# 34: [VARS 477 TO 662 CKT '83'] 56.496 17.614
CHNL# 32: [VARS 477 TO 547004 CKT '74'] -17.61 -56.50



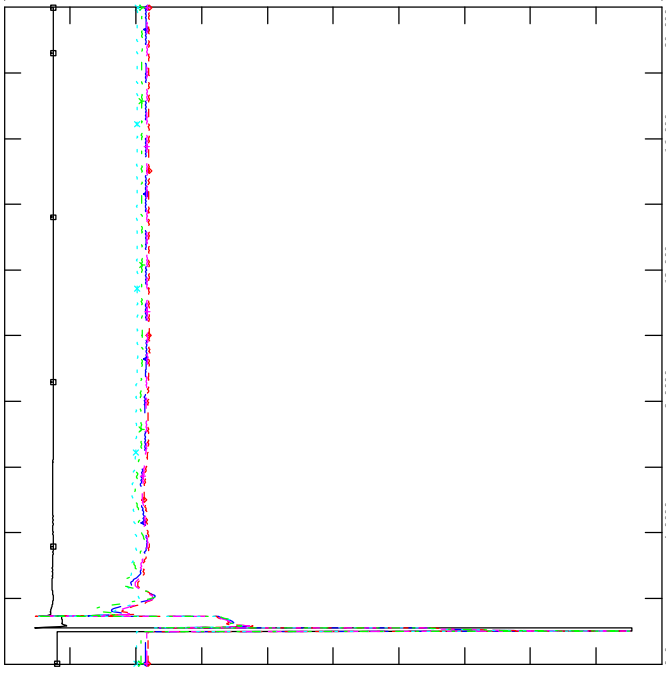
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BUS VOLTAGE

CHNL# 27: [VOLT 976 [ROTBAUR 138.00]] 1.0435 0.93060
CHNL# 26: [VOLT 918 [CASS01 240.00]] 1.0879 0.92700
CHNL# 25: [VOLT 669 [BOWMAN1 240.00]] 1.0889 0.92640
CHNL# 24: [VOLT 662 [WHITLA1 240.00]] 1.0943 0.91980
CHNL# 23: [VOLT 659 [BOWMAN2 138.00]] 1.0560 0.91730
CHNL# 22: [VOLT 645 [BOWMAN3 138.00]] 1.1148 -0.0530



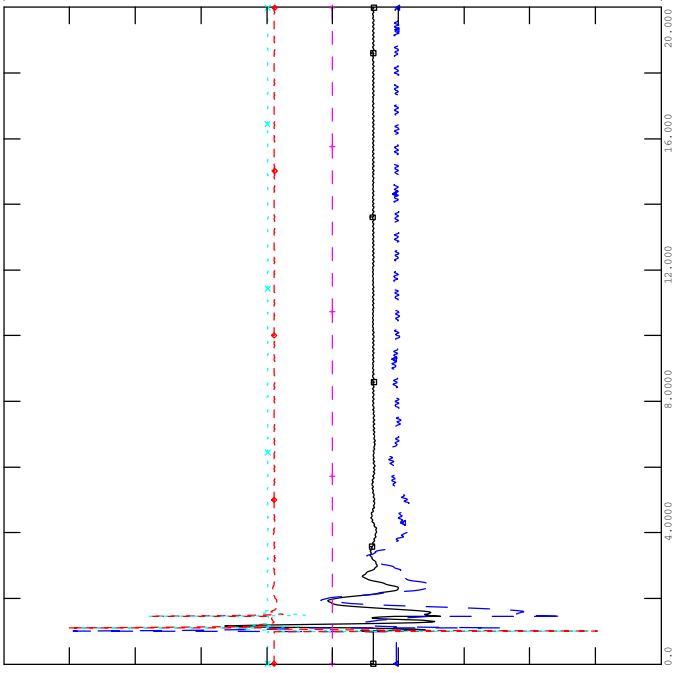
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

ACTIVE POWER

CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1999 1.7418
CHNL# 8: [POWR 61990[SHAMROC6 0.6500]G2] 0.05000 -0.0500
CHNL# 7: [POWR 60990[SHAMROC5 0.6500]G1] 2.2300 1.7097
CHNL# 6: [POWR 773[SECST 20.000]1] 0.82410 0.44540
CHNL# 5: [POWR 713[CMH 14 13.800]14] 0.27070 0.12170



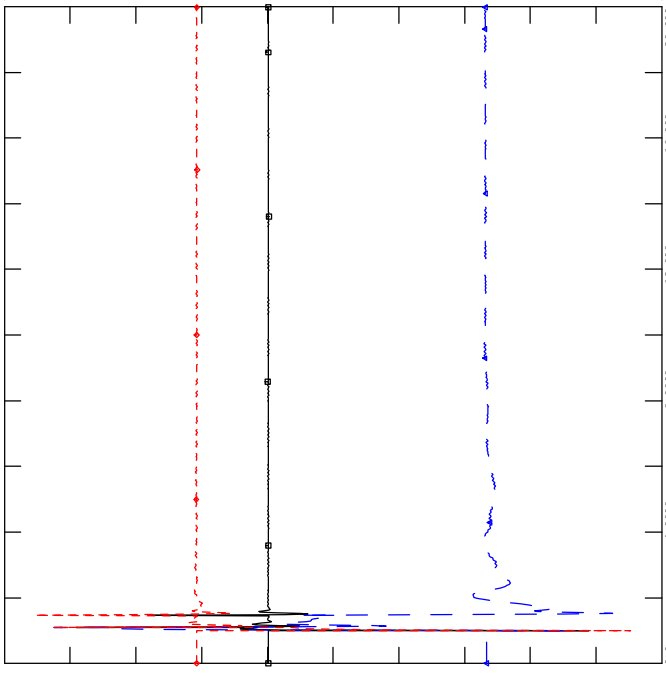
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

P2122 P, Q&ETERM

CHNL# 21: [ETRM560003[P2122_GEN 0.6900]G1] 1.0910 0.91640
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1] 1.2784 0.61330
CHNL# 9: [POWR560003[P2122_GEN 0.6900]G1] 2.1999 1.7418



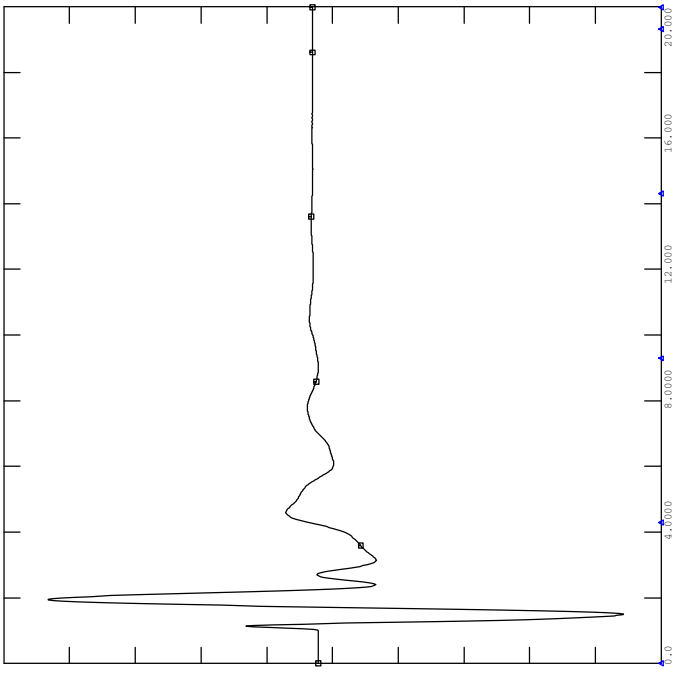
SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

ROTOR ANGLE

CHNL# 2: [ANGL 773[SECST 20.000]1] -36.45 -41.43
CHNL# 1: [ANGL 713[CMH 14 13.800]14] -2.519 -11.35



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 41: [POWR 669 TO 918 CKT '34']
292.11 235.10

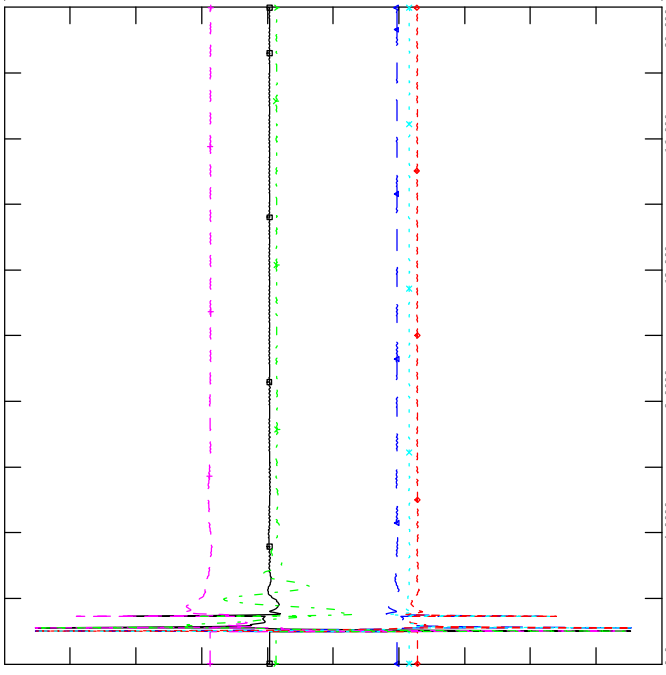
CHNL# 39: [POWR 669 TO 547004 CKT '74']
-302.8 -377.1

CHNL# 37: [POWR 662 TO 720 CKT '64']
45.802 36.981

CHNL# 35: [POWR 669 TO 720 CKT '64']
-203.1 -254.5

CHNL# 33: [POWR 477 TO 662 CKT '83']
-131.2 -167.4

CHNL# 31: [POWR 477 TO 547004 CKT '74']
167.37 131.18



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

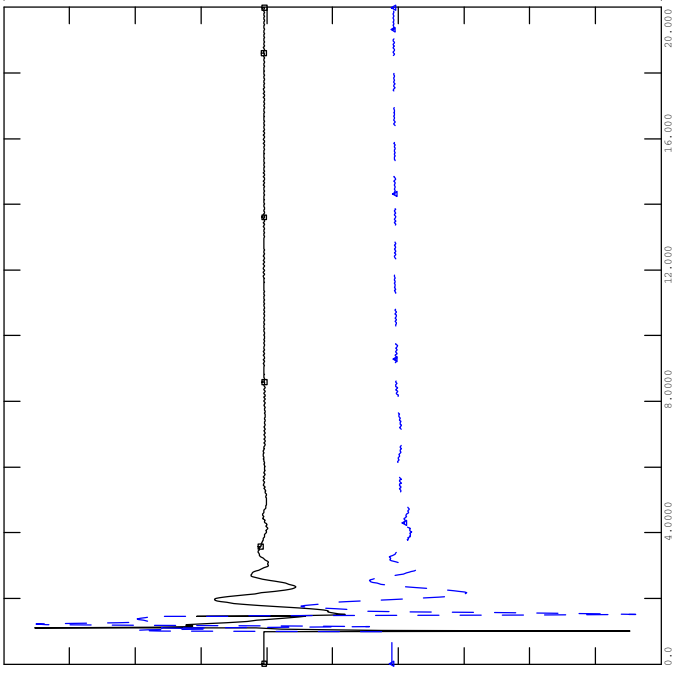
FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 44: [VARS 669 TO 1012 CKT '35']
-1.608 -11.54

CHNL# 43: [POWR 669 TO 1012 CKT '35']
312.76 251.72



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

REACTIVE POWER

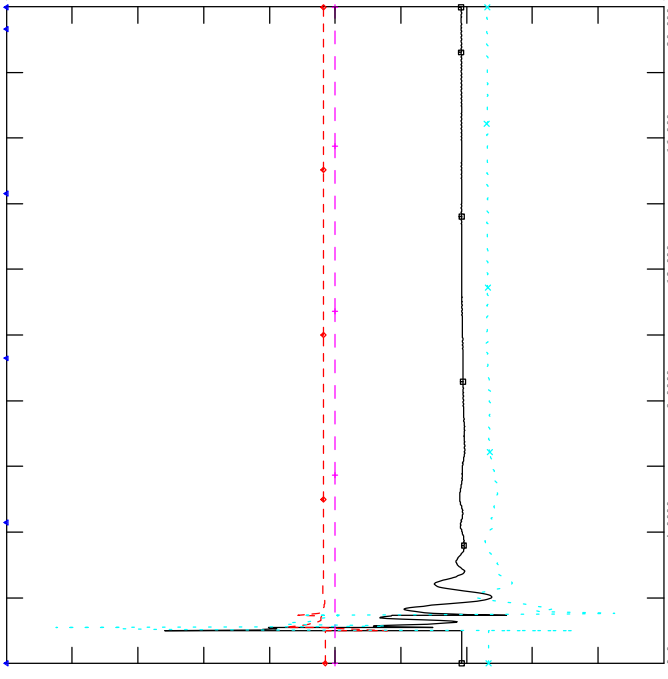
CHNL# 14: [VARS560003[P2122_GEN 0.6900]G1]
1.2784 0.61330

CHNL# 13: [VARS 61990[SHAMROC6 0.6500]G2]
0.05000 -0.0500

CHNL# 12: [VARS 60990[SHAMROC5 0.6500]G1]
0.14570 0.02720

CHNL# 11: [VARS 773[SECST 20.000]1]
0.18640 -0.2840

CHNL# 10: [VARS 713[CMH 14 13.800]14]
0.21880 0.00970



SCENARIO: P2122 SYSTEM IMPACT STUDY
CONTINGENCY -SCN4_SL_24_658L_BOWMANTON

FILE: Scn4_SL_24_658L_Bowmanton.out

FRI, JAN 31 2020 11:14

BRANCH FLOW

CHNL# 42: [VARS 669 TO 918 CKT '34']
-4.220 -18.54

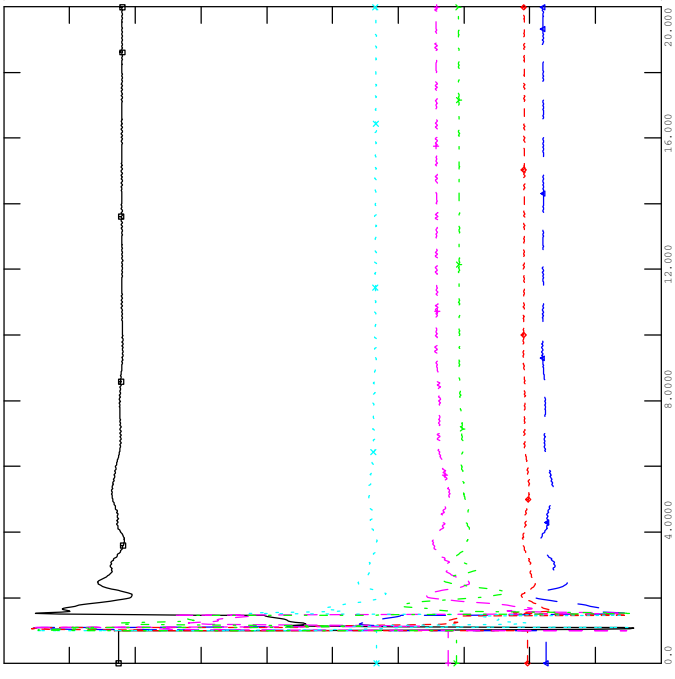
CHNL# 40: [VARS 669 TO 547004 CKT '74']
17.399 -18.72

CHNL# 38: [VARS 662 TO 720 CKT '64']
3.9106 -2.822

CHNL# 36: [VARS 669 TO 720 CKT '64']
33.214 12.967

CHNL# 34: [VARS 477 TO 662 CKT '83']
45.050 19.828

CHNL# 32: [VARS 477 TO 547004 CKT '74']
-19.83 -45.05



Attachment A5
Project Dynamic Data and Assumptions

The dynamic data of the equipment proposed for connection of the Cypress Wind Power Project to the grid is listed in the below tables.

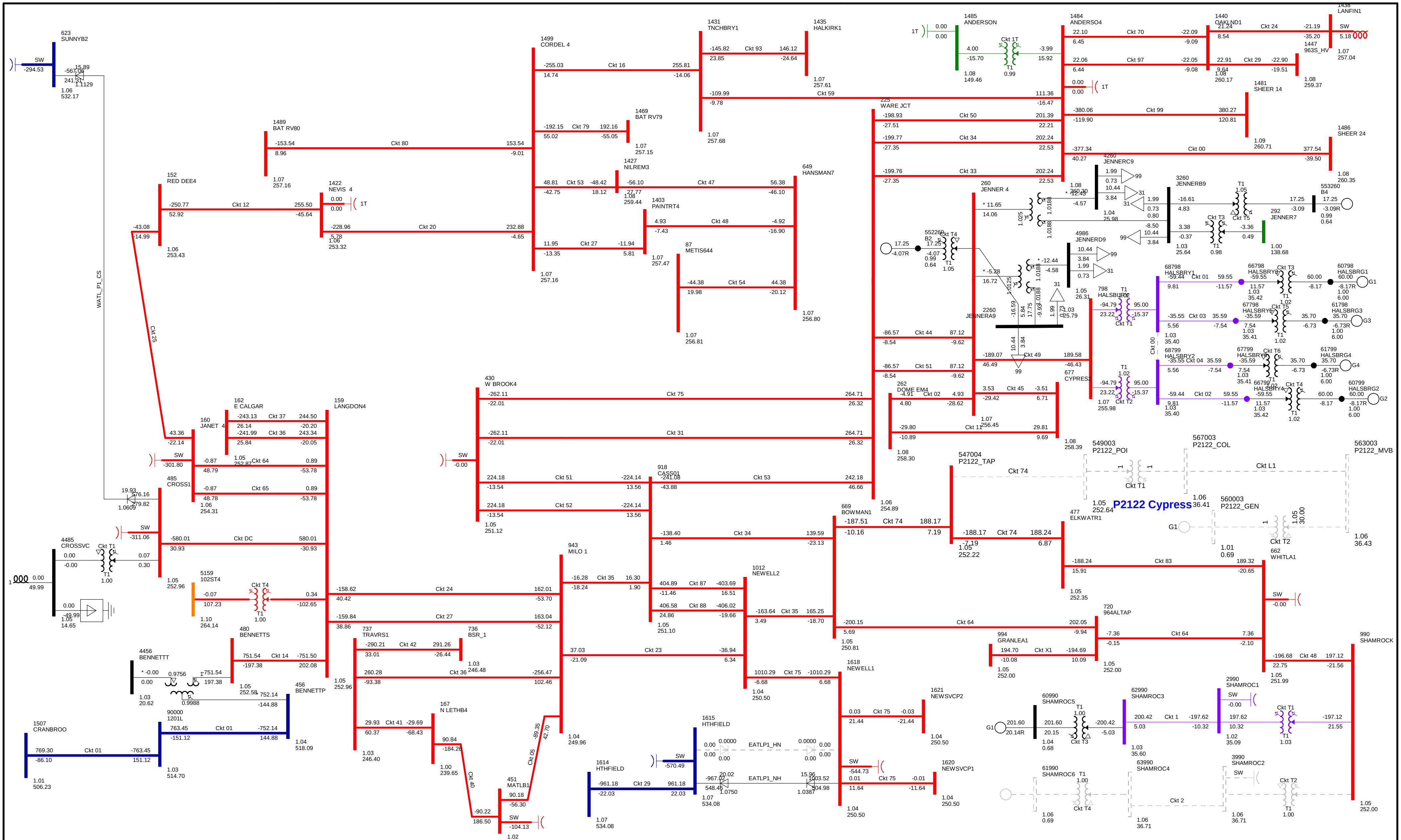
***Table A5-1: Renewable Energy Generator/Converter Model* WT4G1**

TIQCmd	TIPCmd	VLVPL1	VLVPL2	GLVPL	VHVRCR	CURHVRCR	RIP_LVPL	T_LVPL
0.02	0.02	0.4	0.9	1.11	1.2	2.0	2.0	0.02

***Table A5-2: Renewable Energy Electric Control Model* WT4E1**

Remote Bus	PF FALG	VAR FLAG	PQ FLAG	Tfv	Kpv	Kiv	Kpp	Kip	Kf	Tf	Qmx	Qmn
560003	0	1	0	0.15	18.0	5.0	0.05	0.1	0.0	0.08	0.47	-0.47
IPmax	**Trv**	**dPmx**	**dPmn**	**T_power**	**Kqi**	**Vmincl**	**Vmaxcl**	**Kvi**	**Tv**	**Tp**	**ImaxTD**	**Iphl**
1.1	0.0	0.5	-0.5	0.05	0.1	0.9	1.1	120.	0.05	0.05	1.7	1.11
Iqhl												
1.11												

Attachment A6
Post-Mitigation Power Flow Diagrams

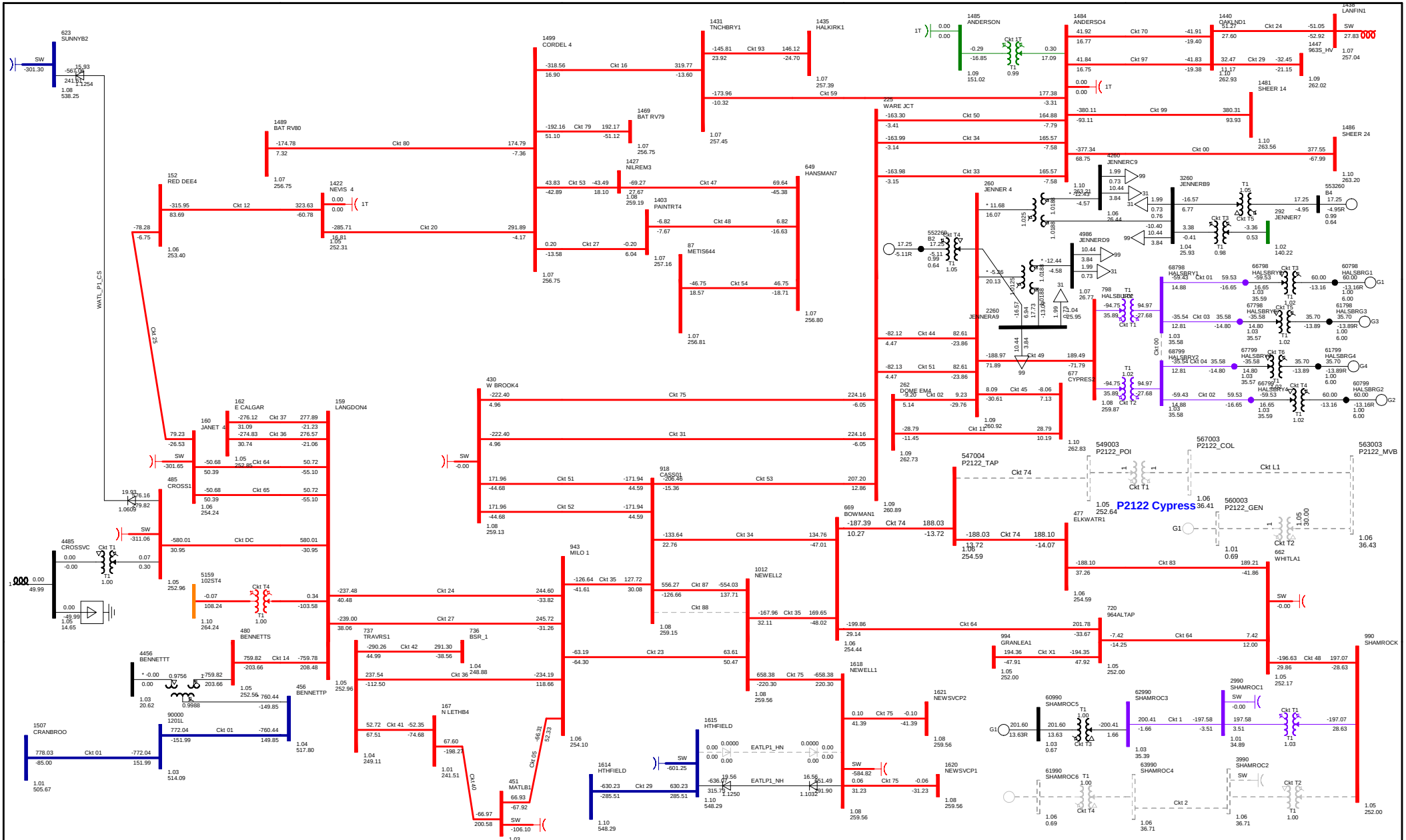


P2122 Cypress Wind Farm (REP)

BC Import:793.73 MW Sask Import:150.00 MW MATL Import:-0.00 MW

MH Export: -62.17 MW

FIGURE A6.1-1-N-0: NORMAL OPERATION
2021 SUMMER PEAK (PRE-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020



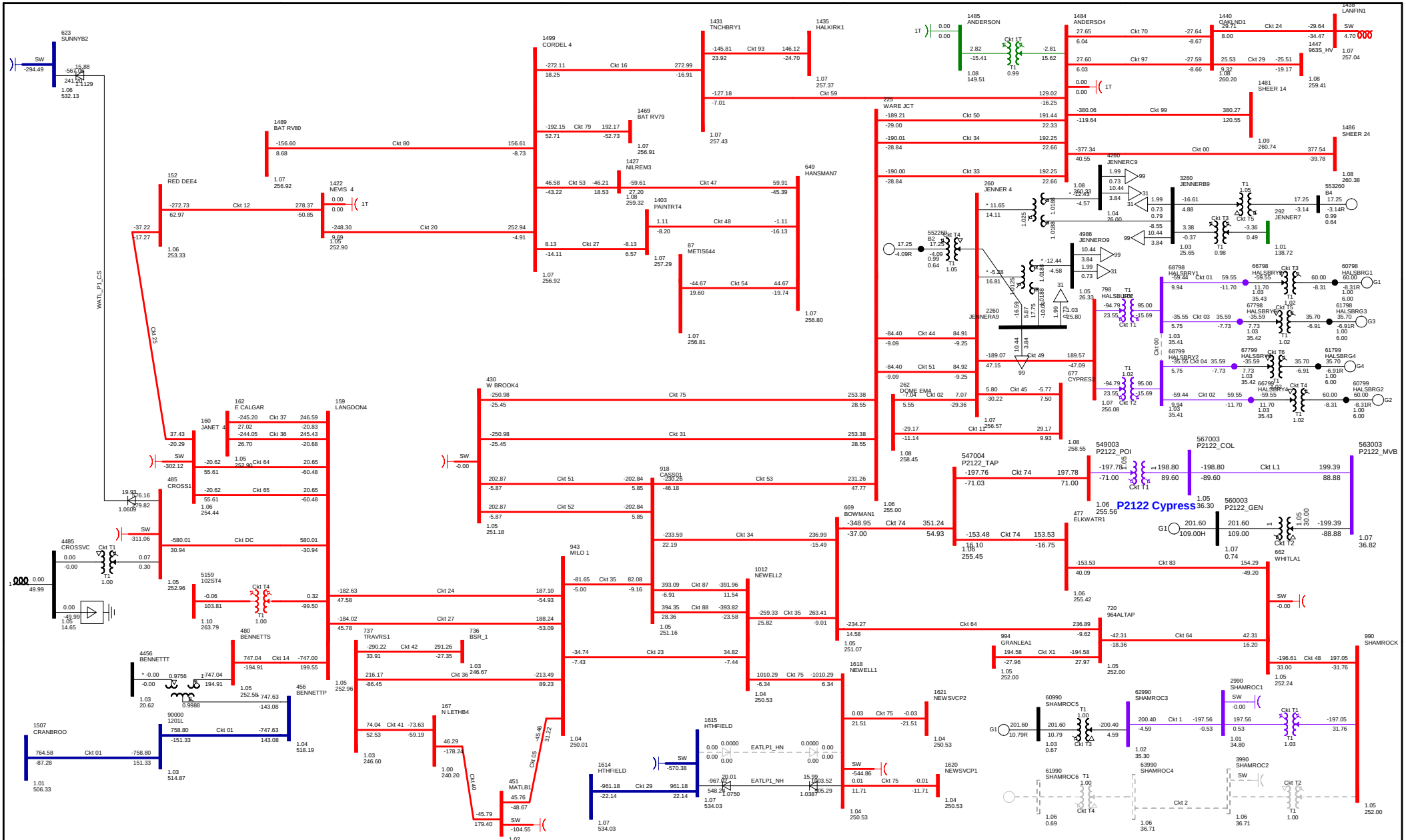
P2122 Cypress Wind Farm (REP)

BC Import:801.17 MW Sask Import:150.00 MW MATL Import:-0.00 MW

MH Export: -62.15 MW

FIGURE A6.1-2 N-1: 1088L (CASSILS 324S TO NEWELL A2075S) WITH EATL RAS
2021 SUMMER PEAK (PRE-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 CV 0.900 UV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



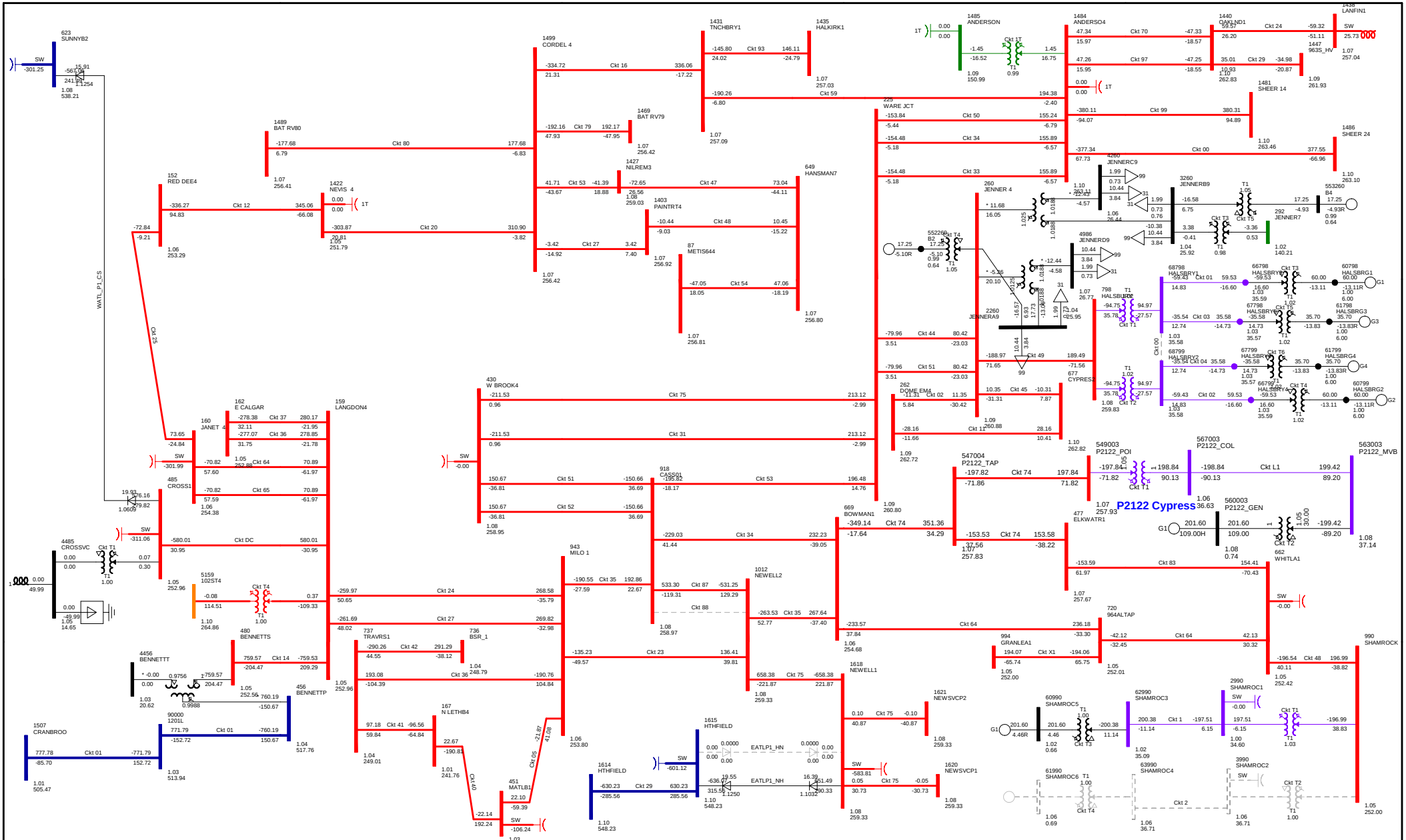
P2122 Cypress Wind Farm (REP)

BC Import:793.18 MW Sask Import:150.00 MW MATL Import:0.00 MW

MH Export: -62.17 MW

FIGURE A6.2-1-N-0: NORMAL OPERATION
2021 SUMMER PEAK (POST-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 kV 0.900 kV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000



P2122 Cypress Wind Farm (REP)

BC Import:805.55 MW Sask Import:150.00 MW MATL Import:-0.00 MW

MH Export: -62.15 MW

FIGURE A6.2-2 N-1: 1088L (CASSILS 324S TO NEWELL A2075S) WITH EATL RAS
2021 SUMMER PEAK (POST-PROJECT)
PRINTED ON FRIDAY 31. JANUARY 2020

Bus - Voltage (kV/pu)
Branch - MW/Mvar
Equipment - MW/Mvar
100.0 %Base A
1.100 kV 0.900 kV
kV: <=25.000 <=69.000 <=138.000 <=240.000 <=500.000 >500.000

Attachment A7
Constraint Effective Factors Table

Contingency (System Element Lost)	Constraint Effective Factors on Thermal Loading on 1087L		
	Medicine Hat Generators	P1812	P2122
2021 SP Scenario 1 (pre-Project)			
1088L	-0.1720	-0.1621	0.0000
2021 SP Scenario 1 (post-Project)			
1088L	-0.1696	-0.1589	-0.1625