PI-2026-1 Provisional Interconnection Study Report

Xcel Energy
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1.0 Executive Summary

This Provisional Interconnection Service (PIS)[1] Study has been prepared in accordance with the Xcel Energy Open Access Transmission Tariff and the executed Provisional Interconnection Study Agreement between the Interconnection Customer (IC) and the Transmission Provider (TP) – Public Service Company of Colorado (PSCo). This PI request has been given the queue number as PI-2026-1. The PI request is for a 372.02 MW gross Photovoltaic (PV) facility, with a Point of Interconnection (POI) at the Comanche 230 kV switching station.

The total estimated cost of the PSCo transmission system improvements required for PI-2026-1 to qualify for Provisional Interconnection service is estimated to be $0.450 million.

Based on the power flow, stability, and short-circuit analyses, the maximum allowable output for the Generating Facility is 0 MW. The short-circuit (breaker duty) analysis on the PSCo transmission system identified two circuit breakers at Midway 230 kV (5129 and 9636) and one circuit switcher at CF&I Furnace 230 kV (5409) as over-dutied due to the addition of PI-2026-1. The output amount of the Generating Facility in the PLGIA[2] will be reviewed quarterly and updated if there are changes to the system conditions assumed in this analysis.

Security: PI-2026-1 is a request for Network Resource Interconnection Service (NRIS). For this NRIS request, security shall estimate the risk associated with the Network Upgrades and the Interconnection Facilities and is assumed to be a minimum of $25 million.

The Interconnection Customer assumes all risks and liabilities with respect to changes between the PLGIA and the LGIA[3], including changes in output limits and Interconnection Facilities, Network Upgrades, Distribution Upgrades, and/or System Protection Facilities cost responsibility. This Provisional Interconnection Service in and of itself does not convey transmission service.

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[1] **Provisional Interconnection Service (PIS)** shall mean an Interconnection Service provided by Transmission Provider associated with interconnecting the Interconnection Customer's Generating Facility to Transmission Provider's Transmission System and enabling that Transmission System to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Provisional Large Generator Interconnection Agreement and, if applicable, the Tariff.

[2] **Provisional Large Generator Interconnection Agreement (PLGIA)** shall mean the interconnection agreement for Provisional Interconnection Service established between Transmission Provider and/or the Transmission Owner and the Interconnection Customer. The pro forma agreement is provided in Appendix 14 and takes the form of the Standard Large Generator Interconnection Agreement, modified for provisional purposes.

[3] **Standard Large Generator Interconnection Agreement (LGIA)** shall mean the form of interconnection agreement applicable to an Interconnection Request pertaining to a Large Generating Facility that is included in the Transmission Provider's Tariff.

2.0 Introduction

This PI request is for a 372.02 MW gross Solar Photovoltaic (PV) Generating Facility, with a maximum net injection of 335 MW at the Point of Interconnection, located in Pueblo County, Colorado. The study evaluated the impacts on the PSCo transmission system and Affected Systems by modeling the Generating Facility at 335 MW net output at the Point of Interconnection.

- The POI of this project is at the Comanche 230 kV switching station.
- The Commercial Operation Date (COD) to be studied for PI-2026-1 is 11/1/2026.

The geographical location of the transmission system near the POI is shown in Figure 1.

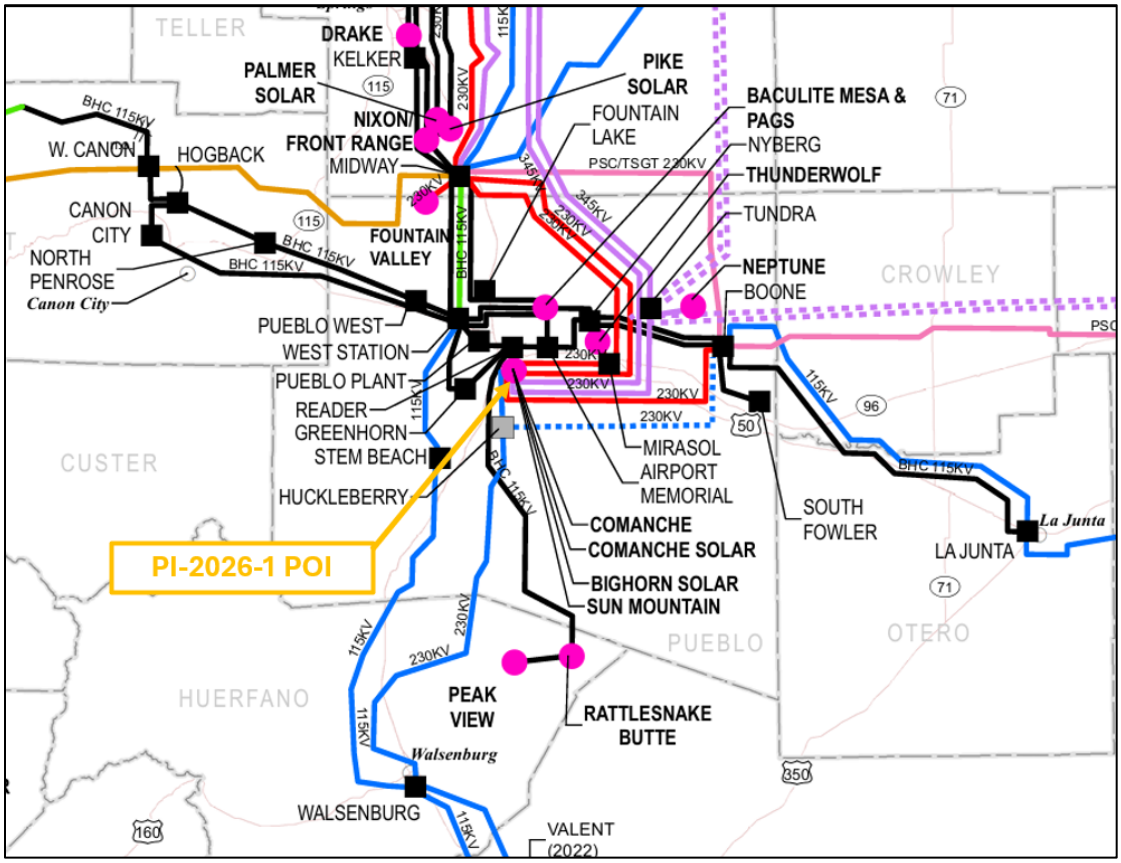

Figure 1: Point of Interconnection of PI-2026-1.

3.0 Study Scope

The study scope included power flow (thermal and voltage), stability, voltage and reactive capability, and short-circuit analyses, as well as cost estimates for Interconnection Facilities and Station Network Upgrades. The study also identified the Contingent Facilities associated with the Provisional Interconnection Service.

3.1 Power Flow and Stability Analysis Criteria

The Power Flow and Stability Analysis criteria used for this study follow the guidelines set forth in the TPL-001-WECC-CRT-4 under requirement WR1. For PSCo and non-PSCo facilities, thermal violations attributed to the request include all new facility overloads with a thermal loading >100% and increased by 1% or more from the benchmark case overload post the GIR addition. Thermal loadings are calculated based on Normal Rating (Rate A) for System Intact and Single contingency analysis, while thermal loadings are calculated based on Emergency Rating (Rate B) for Multiple Contingency analysis. These two ratings, Rate A and Rate B, are referenced in the tables summarizing loading violation results.

3.2 Short-Circuit Analysis Criteria (Breaker Duty)

Fault Current after PI addition shall not exceed 100% of the applicable Breaker Duty rating. PSCo can only perform breaker duty analysis on the PSCo Transmission System. Before PI-2026-1 goes in service the Affected Systems may choose to perform a breaker duty analysis to identify breaker duty violations on their system.

3.3 Benchmark Case Modeling

The Benchmark Case was created from the Base Case (2026HS) as described in Chapter 3 of the BPM, by modifying the study pocket generation dispatch to reflect heavy generation in the South study pocket.

3.4 Study Case Modeling

PI-2026-1 was modeled as a 372.02 MW gross Solar Photovoltaic (PV) Generating Facility with a maximum net output of 335 MW at the Point of Interconnection.

- Solar PV Machine model – Eighty-nine (89) Sungrow SG4400UD-MV-20 inverters, each rated 4.4 MVA.
- Length of Gen-Tie – 4.03 miles. PI-2026-1 shares the generation tie line with REPL-2021-001

- Three (3) main step-up transformers, with winding voltages of 230/34.5/13.8 kV, and ratings of 94/125.3/156.7 MVA.

The Study Case was created from the Benchmark Case by turning on the PI-2026-1 generation, which corresponds to an additional 335 MW injected at the POI. The project generation was balanced against PSCo generation outside of the Southern Colorado study pocket. The facility's diagram in PSLF is presented in Figure 2, and modeling data (.epc and .dyd files) are attached in Appendix A.

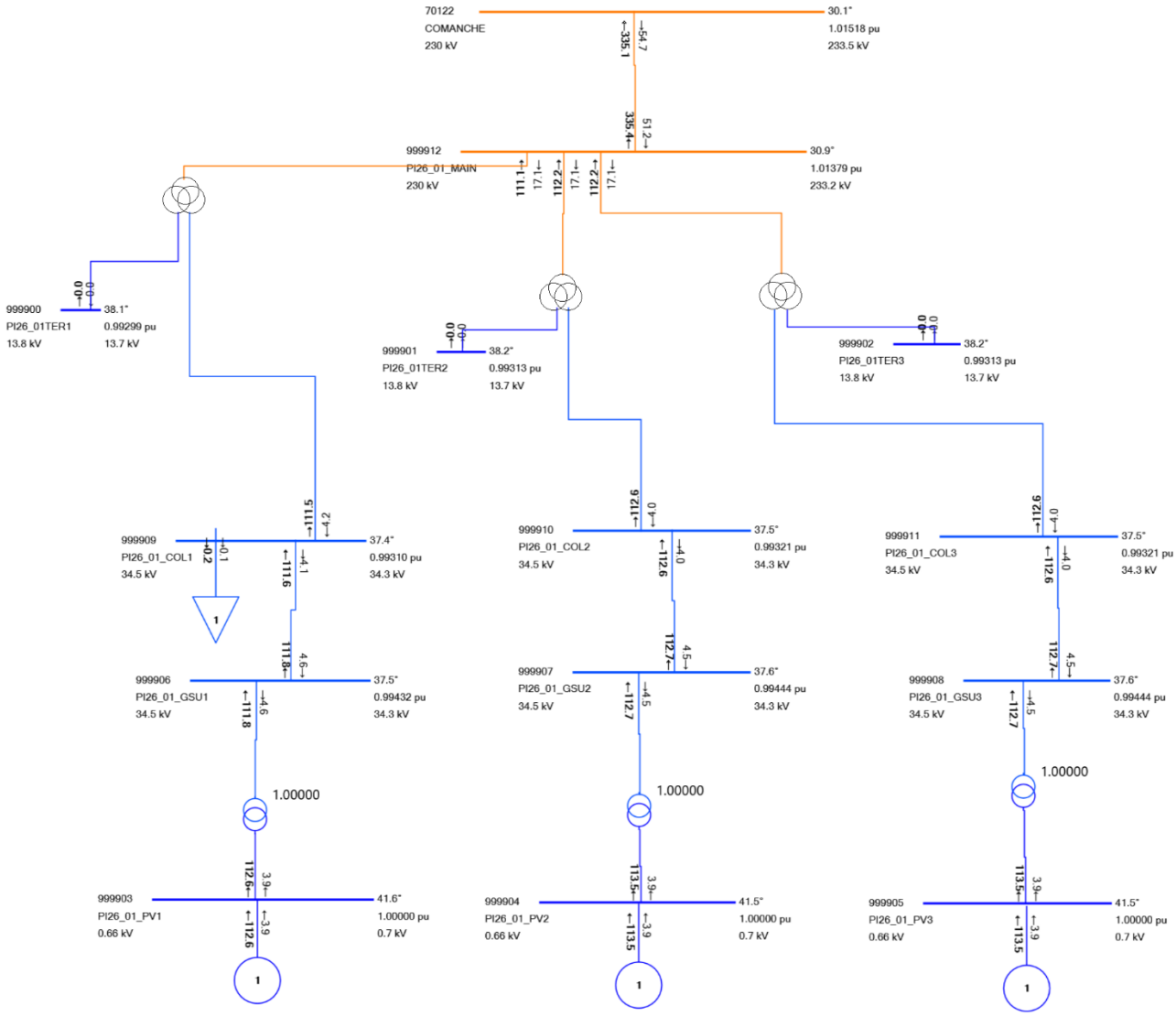

Figure 2: PSLF Model representation of PI-2026-1.

3.5 Short-Circuit Modeling

All connected generating facilities were assumed capable of producing maximum fault current. Accordingly, all generators were modeled at full capacity, regardless of whether NRIS or ERIS was requested. Generation was modeled as a separate generating resource in CAPE and included at full capacity in the short circuit study, independent of any operating limitations that would otherwise be imposed.

3.6 Voltage and Reactive Power Capability Evaluation

Per Section 4.1.1.1 of the BPM, the following voltage regulation and reactive power capability requirements are applicable to non-synchronous generators:

- Xcel Energy's OATT requires all non-synchronous generator Interconnection Customers to provide dynamic reactive power within the power factor range of 0.95 leading to 0.95 lagging at the high side of the generator substation. Furthermore, Xcel Energy requires every Generating Facility to have dynamic voltage control capability to assist in maintaining the POI voltage schedule specified by the Transmission Operator.
- It is the responsibility of the Interconnection Customer to determine the type (switched shunt capacitors and/or switched shunt reactors, etc.), the size (MVar), and the locations (on the Interconnection Customer's facility) of any additional static reactive power compensation needed within the generating plant in order to have adequate reactive capability to meet the +/- 0.95 power factor at the high side of the main step-up transformer.
- It is the responsibility of the Interconnection Customer to compensate their generation tie-line to ensure minimal reactive power flow under no load conditions.

All the summary tables representing the GIR's Voltage and Reactive Power Capability tests adhere to the following color formatting representing the different aspects of the tests:

- Values highlighted in red indicate a failed reactive power requirement.
- Voltages outside the range of 0.95 p.u. to 1.05 p.u. are highlighted in yellow to provide additional information.

The PI-2026-1 GIR is modeled as follows:

PV 1: Pmax = 121.2 MW, Pmin = 0.00 MW, Qmax = 58.3 Mvar, Qmin= -58.3 Mvar

PV 2: Pmax = 125.4 MW, Pmin = 0.00 MW, Qmax = 67.4 Mvar, Qmin= -67.4 Mvar

PV 3: Pmax = 125.4 MW, Pmin = 0.00 MW, Qmax = 67.4 Mvar, Qmin= -67.4 Mvar

The summary for the Voltage and Reactive Power Capability Evaluation for PI-2026-1 is:

- The GIR is capable of meeting ±0.95 pf at the high side of the main step-up transformer while maintaining a normal operating voltage at the POI.
- The GIR is capable of meeting ±0.95 pf at its terminals while meeting the interconnection service request.
- The reactive power exchange and voltage change across the gen-tie are acceptable under no load conditions.

The Voltage and Reactive Power Capability tests performed for PI-2026-1 are summarized in Table 1.

Table 1 – Reactive Capability Evaluation for PI-2026-1

Reactive Power Capability - Project PI_2026_1 - MPT High Side PF Checks																						
Generator 1 Terminals					Generator 2 Terminals					Generator 3 Terminals					High Side of Main Transformer				POI			
Pgen (MW)	Qgen (Mvar)	Qmax (Mvar)	Qmin (Mvar)	V (p.u.)	Pgen (MW)	Qgen (Mvar)	Qmax (Mvar)	Qmin (Mvar)	V (p.u.)	Pgen (MW)	Qgen (Mvar)	Qmax (Mvar)	Qmin (Mvar)	V (p.u.)	P (MW)	Q (Mvar)	V (p.u.)	PF	P (MW)	Q (Mvar)	V (p.u.)	PF
113.5	58.3	58.3	-58.3	0.99	113.5	64.6	67.4	-67.4	1.00	113.5	64.6	67.4	-67.4	1.00	335.7	112.8	1.01	0.9479	335.3	108.8	1.00	0.9512
113.5	-17.1	58.3	-58.3	1.00	113.5	-17.5	67.4	-67.4	1.00	113.5	-17.5	67.4	-67.4	1.00	336.2	-116.8	0.99	-0.9446	335.8	-121.1	1.00	-0.9407
0.0	0.2	58.3	-58.3	0.98	0.0	0.2	67.4	-67.4	0.98	0.0	0.2	67.4	-67.4	0.98	-0.3	0.0	1.00	-1.0000	-0.9	1.7	1.00	-0.4679

3.7 Power Flow Analysis Results

Contingency analysis was performed on the South Colorado study pocket Study Case. As part of the analysis, following scenarios were evaluated.

- Scenario 1 is the original case with PI-2026-1 at full output.
- Scenario 2 has Comanche 2 and 3 online with Comanche 2 at full output and Comanche 3 at reduced output.
- Scenario 3 has Comanche 2 and 3 online with Comanche 2 and 3 at reduced output.

The power flow results are summarized as follows:

- System intact contingency analysis showed no thermal or voltage violations attributable to PI-2026-1.
- Results of the single contingency analysis are shown in Table 2. Single contingency analysis showed no voltage violations attributable to PI-2026-1. Redispatches for Scenarios 2 and 3 are shown in Table 3 and Table 4, respectively. No convergence issues are observed in Single contingency analysis.
- Results of the multiple contingency analysis are shown in Table 5. Multiple contingency analysis showed voltage violations attributable to PI-2026-1 and are shown in Table 6.

All single contingency overloads identified in Table 2 were alleviated through generation redispatch, as reflected in the Redispatch Study Case results presented in the last column of the table. Redispatch was selected to minimally change the dispatch at the POI generator Comanche 2 230 kV. The redispatch to solve the single contingency overloads is shown in Table 4. Note that Scenario 2 was included to show the study results with Comanche 2 unit running at its original case output.

Multiple contingency overloads and divergences are mitigated using system adjustments, including generation redispatch (includes GIRs under study) and/or operator actions. None of the multiple contingency overloads and divergences are attributed to the study GIR.

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Table 2 – South Colorado – Single Contingency Thermal Overloads

Ref. No.	Monitored Facility	Contingency Name	Area	Owner	Rate A (MVA)	BM Case AC Loading (%)	Scenario 1 PI-2026-01 Dispatched at 335.0 MW		Scenario 2 PI-26-01 Dispatched at 335.0 MW and Xcel Redispatch 1		Scenario 3 PI-2026-01 Dispatched at 320.0 MW and Xcel Redispatch 2	
							AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)
1	CTTNWD N (73391) – KETTLECK S (73410) 115 kV CKT 1	73389 BRIARGATE S 115 73710 BRIARGATE N 115 1 1	73	CSU	162	155.5	164.0	8.5	156.2	0.7	155.8	0.3
2	FOXRUN (73414) – FLYHORSE N2 (73738) 115 kV CKT 1	P21To: 72413 VOLLMERT 115 73481 FULLER 115 1 1	73	CSU	142	139.2	151.2	12.0	140.0	0.8	139.4	0.2
3	FLYHORSE S (73576) – KETTLECK N (73711) 115 kV CKT 1	P21To: 72413 VOLLMERT 115 73481 FULLER 115 1 1	73	CSU	162	134.2	144.9	10.7	134.9	0.7	134.4	0.2
4	W.CANON (70550) – HOGBACK115 (71025) 115 kV CKT 1	P21From: 73413 MIDWAYBR 230 73638 HAMBONE TAP 230 1 1	70	WPGT	120	127.4	138.8	11.4	124.7	-2.6	124.2	-3.1
5	SMELTER (70394) – W.CANON (70550) 115 kV CKT 1	P21From: 73551 W CANON 230 79054 PONCHABR 230 1 1	70	WPGT	73	121.8	133.6	11.9	118.2	-3.5	117.7	-4.0
6	DANIEL_PK (70139) – PRAIRIE_3 (70323) 230 kV CKT 2	70139 DANIEL_PK 230 70331 PRAIRIE_1 230 1 1	70	PSCo	478	115.0	123.9	8.9	114.4	-0.5	113.8	-1.1
7	GREENWOOD_1 (70212) – GREENWOOD_2 (70189) 230 kV CKT 1	70139 DANIEL_PK 230 70323 PRAIRIE_3 230 2 1	70	PSCo	484	114.3	117.2	2.9	106.7	-7.5	106.6	-7.6

Ref. No.	Monitored Facility	Contingency Name	Area	Owner	Rate A (MVA)	BM Case AC Loading (%)	Scenario 1 PI-2026-01 Dispatched at 335.0 MW		Scenario 2 PI-26-01 Dispatched at 335.0 MW and Xcel Redispatch 1		Scenario 3 PI-2026-01 Dispatched at 320.0 MW and Xcel Redispatch 2	
							AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)
8	BRIARGATE N (73710) – KETTLECK N (73711) 115 kV CKT 1	P21To: 73391 CTTNWD N 115 73410 KETTLECK S 115 1 1	73	CSU	186	108.4	114.9	6.5	108.9	0.5	108.6	0.2
9	KELKER E (73408) – TEMPLTON (73422) 115 kV CKT 1	73408 KELKER E 115 73420 ROCKISLD 115 1 1	73	CSU	131	106.4	110.8	4.4	106.9	0.5	106.7	0.3
10	PUEBPLNT (70339) – READER (70352) 115 kV CKT 1	P21From: 70004 GREENHRN 115 70352 READER 115 1 1	70	WPGT	160	98.0	110.2	12.2	98.6	0.6	98.1	0.1
11	MONACO_12 (70481) – SULLIVAN_2 (70365) 230 kV CKT 1	70046 BUCKLEY2 230 70491 TOLLGATE 230 1 1	70	PSCo	445	105.0	107.8	2.8	97.5	-7.4	97.8	-7.1
12	KELKER E (73408) – ROCKISLD (73420) 115 kV CKT 1	73408 KELKER E 115 73422 TEMPLTON 115 1 1	73	CSU	162	103.2	106.9	3.7	103.6	0.4	103.4	0.2
13	VOLLMERT (72413) – FULLER (73481) 115 kV CKT 1	P21To: 73576 FLYHORSE S 115 73711 KETTLECK N 115 1 1	73	TSGT	173	98.6	105.1	6.5	99.1	0.5	98.7	0.1
14	FTN_VLY (70193) – MIDWAYBR (73412) 115 kV CKT 1	P21From: 70286 MIDWAY_PS 230 73413 MIDWAYBR 230 1 1	70/73	WPGT	179	88.9	104.8	16.0	90.2	1.3	89.5	0.6
15	DANIEL_PK (70139) – PRAIRIE_1 (70331) 230 kV CKT 1	70139 DANIEL_PK 230 70323 PRAIRIE_3 230 2 1	70	PSCo	571	96.2	103.6	7.4	95.8	-0.3	95.3	-0.8

Ref. No.	Monitored Facility	Contingency Name	Area	Owner	Rate A (MVA)	BM Case AC Loading (%)	Scenario 1 PI-2026-01 Dispatched at 335.0 MW		Scenario 2 PI-26-01 Dispatched at 335.0 MW and Xcel Redispatch 1		Scenario 3 PI-2026-01 Dispatched at 320.0 MW and Xcel Redispatch 2	
							AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)	AC Loading (%)	Loading Diff. (%)
16	GREENWOOD_2 (70189) – MONACO_12 (70481) 230 kV CKT 1	70046 BUCKLEY2 230 70491 TOLLGATE 230 1 1	70	PSCo	503	100.4	102.9	2.5	94.1	-6.2	94.0	-6.3
17	FOXRUN (73414) – FLYHORSE N2 (73738) 115 kV CKT 1	P21From: 70139 DANIEL_PK 230 73477 FULLER 230 1 1	73	CSU	142	116.3	130.6	14.3	117.5	1.2	116.8	0.5
18	FLYHORSE S (73576) – KETTLECK N (73711) 115 kV CKT 1	LoTC_26	73	CSU	162	114.1	126.7	12.6	115.1	1.0	114.5	0.4

Table 3 – South Colorado – Single Contingency Redispatch 1 Mitigation for Scenario 2

Ref. No.	Bus Number	Bus Name	ID	Original Pgen (MW)	Original Status	Modified Pgen (MW)	Modified Status
1	70562	SPRUCE1	G1	80.0	1	79.3	1
2	70951	ST.VR_6	G6	100.0	1	93.0	1
3	70448	VALMNT6	G6	0.0	0	46.6	1
4	70188	FT_LUPTN_12	G1	0.0	0	45.9	1
5	70188	FT_LUPTN_12	G2	0.0	0	44.8	1
6	70558	VALMNT8	G8	0.0	0	41.8	1
7	70557	VALMNT7	G7	0.0	0	40.7	1

Ref. No.	Bus Number	Bus Name	ID	Original Pgen (MW)	Original Status	Modified Pgen (MW)	Modified Status
8	70563	SPRUCE2	G2	98.0	1	127.0	1
9	70069	CABCRKA	HA	138.0	1	169.5	1
10	70070	CABCRKB	HB	138.0	1	162.0	1
11	70180	FRUITA	G1	0.0	0	19.7	1
12	70147	CHEROKEE7	ST	219.0	1	232.0	1
13	70589	RMEC2	G2	145.0	1	156.1	1
14	70409	ST.VRAIN	ST	307.0	1	317.8	1
15	70591	RMEC3	ST	310.0	1	198.8	1
16	70408	ST.VR_4	G4	165.0	1	173.6	1
17	70950	ST.VR_5	G5	150.0	1	156.2	1
18	70407	ST.VR_3	G3	150.0	1	156.0	1
19	70406	ST.VR_2	G2	158.0	1	163.7	1
10	70588	RMEC1	G1	145.0	1	147.1	1
21	70145	CHEROKEE5	G5	179.0	1	179.2	1
22	70120	COMAN_2	C2	335.0	1	335.0	1
23	70777	COMAN_3	C3	804.9	1	495.0	1

Table 4 – South Colorado – Single Contingency Redispatch 2 Mitigation for Scenario 3

Ref. No.	Bus Number	Bus Name	ID	Original Pgen (MW)	Original Status	Modified Pgen (MW)	Modified Status
1	70562	SPRUCE1	G1	80.0	1	79.3	1
2	70951	ST.VR_6	G6	100.0	1	93.0	1

Ref. No.	Bus Number	Bus Name	ID	Original Pgen (MW)	Original Status	Modified Pgen (MW)	Modified Status
3	70448	VALMNT6	G6	0.0	0	46.6	1
4	70188	FT_LUPTN_12	G1	0.0	0	45.9	1
5	70188	FT_LUPTN_12	G2	0.0	0	44.8	1
6	70558	VALMNT8	G8	0.0	0	41.8	1
7	70557	VALMNT7	G7	0.0	0	40.7	1
8	70563	SPRUCE2	G2	98.0	1	135.5	1
9	70069	CABCRKA	HA	138.0	1	169.5	1
10	70070	CABCRKB	HB	138.0	1	162.0	1
11	70180	FRUITA	G1	0.0	0	19.7	1
12	70147	CHEROKEE7	ST	219.0	1	232.0	1
13	70589	RMEC2	G2	145.0	1	156.1	1
14	70409	ST.VRAIN	ST	307.0	1	317.8	1
15	70591	RMEC3	ST	310.0	1	205.3	1
16	70408	ST.VR_4	G4	165.0	1	173.6	1
17	70950	ST.VR_5	G5	150.0	1	156.2	1
18	70407	ST.VR_3	G3	150.0	1	156.0	1
19	70406	ST.VR_2	G2	158.0	1	163.7	1
20	70588	RMEC1	G1	145.0	1	147.1	1
21	70145	CHEROKEE5	G5	179.0	1	179.2	1
22	70120	COMAN_2	C2	335.0	1	320.0	1
23	70777	COMAN_3	C3	804.9	1	495.0	1

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Table 5– South Colorado – Multiple Contingency Thermal Overloads

Ref. No.	Monitored Facility	Contingency Name	Area	Rate B (MVA)	Owner	BM Case AC Loading (%)	Study Case AC Loading (%)	Loading Diff. (%)
1	FTN_VLY (70193) – MIDWAYBR (73412) 115 kV CKT 1	BF_094d	70/73	179	WPGT	130.1	150.1	19.9
2	W.CANON (70550) – HOGBACK115 (71025) 115 kV CKT 1	BF_094d	70	120	WPGT	130.1	142.9	12.8
3	DESRTCOV (70449) – W.STATON (70456) 115 kV CKT 1	BF_094d	70	221	WPGT	113.5	129.8	16.2
4	DANIEL_PK (70139) – PRAIRIE_3 (70323) 230 kV CKT 2	BF_064b	70	478	PSCo	116.6	122.9	6.3
5	FTN_VLY (70193) – DESRTCOV (70449) 115 kV CKT 1	BF_094d	70	221	WPGT	106.0	122.1	16.1
6	PUEBPLNT (70339) – READER (70352) 115 kV CKT 1	BF_094d	70	160	WPGT	107.5	120.5	13.0
7	FOXRUN (73414) – FLYHORSE N2 (73738) 115 kV CKT 1	BF_045r	73	157	CSU	105.7	118.6	12.9
8	FLYHORSE S (73576) – KETTLECK N (73711) 115 kV CKT 1	BF_045r	73	180	CSU	103.1	114.5	11.3
9	MONACO_12 (70481) – SULLIVAN_2 (70365) 230 kV CKT 1	BF_004a	70	445	PSCo	106.6	111.8	5.1
10	GREENWOOD_1 (70212) – GREENWOOD_2 (70189) 230 kV CKT 1	BF_045s	70	484	PSCo	108.1	111.10	2.9
11	LEETSDALE (70260) – MONROEPS (70291) 230 kV CKT 1	BF_087h	70	319	PSCo	104.9	107.5	2.6
12	HYDEPARK (70236) – PUEBPLNT (70339) 115 kV CKT 1	BF_094d	70	159	WPGT	92.5	105.5	13.0

Ref. No.	Monitored Facility	Contingency Name	Area	Rate B (MVA)	Owner	BM Case AC Loading (%)	Study Case AC Loading (%)	Loading Diff. (%)
13	CTTNWD N (73391) – KETTLECK S (73410) 115 kV CKT 1	BF_045r	73	180	CSU	97.0	104.6	7.6
14	DANIEL_PK (70139) – PRAIRIE_1 (70331) 230 kV CKT 1	BF_045s	70	571	PSCo	93.6	101.2	7.5
15	PUEBPLNT (70339) – READER (70352) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	160	WPGT	136.7	162.9	26.2
16	FOXRUN (73414) – FLYHORSE N2 (73738) 115 kV CKT 1	P7_129 (Lines: 5119 7051)	73	157	CSU	144.3	162.8	18.5
17	FLYHORSE S (73576) – KETTLECK N (73711) 115 kV CKT 1	P7_129 (Lines: 5119 7051)	73	180	CSU	136.9	153.1	16.2
18	FTN_VLY (70193) – MIDWAYBR (73412) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70/73	179	WPGT	124.9	152.9	27.9
19	HYDEPARK (70236) – PUEBPLNT (70339) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	159	WPGT	121.6	147.3	25.6
20	DANIEL_PK (70139) – FULLER (73477) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70/73	478	PSCo	120.6	145.8	25.2
21	PALMER_LK (70308) – FOXRUN (73414) 115 kV CKT 1	P7_129 (Lines: 5119 7051)	70/73	162	PSCo	119.7	137.7	18.0
22	W.CANON (70550) – HOGBACK115 (71025) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	120	WPGT	114.9	135.7	20.8
23	DESRTCOV (70449) – W.STATON (70456) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	221	WPGT	109.6	132.7	23.1
24	BOONE (70061) – MIDWAY_PS (70286) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70	319	PSCo/ TSGT	108.6	130.9	22.3
25	CTTNWD N (73391) – KETTLECK S (73410) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	73	180	CSU	116.4	130.5	14.1

Ref. No.	Monitored Facility	Contingency Name	Area	Rate B (MVA)	Owner	BM Case AC Loading (%)	Study Case AC Loading (%)	Loading Diff. (%)
26	MIDWAY_PS (70286) – MIDWAYBR (73413) 230 kV CKT 1	P7_130 (Lines: 5129 7051)	70/73	637	WAPA	111.1	125.9	14.8
27	FTN_VLY (70193) – DESRTCOV (70449) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	221	WPGT	101.8	124.4	22.6
28	MIDWAYBR (73412) – RANCHO (73416) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	73	119	TSGT	105.1	119.9	14.8
29	LAMAR_SWYD (70254) – LAMAR_C2 (70255) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70	239	PSCo	101.6	116.8	15.1
30	MIDWAY_PS (70286) – MIRASOL (70652) 230 kV CKT 2	P7_55 (Lines: 7015 7017)	70	478	PSCo	96.0	116.4	20.4
31	SMELTER (70394) – W.CANON (70550) 115 kV CKT 1	P7_55 (Lines: 7015 7017)	70	73	WPGT	95.7	113.0	17.3
32	DANIEL_PK (70139) – PRAIRIE_3 (70323) 230 kV CKT 2	P7_152 (Lines: 5167 5285 5169)	70	478	PSCo	106.9	110.5	3.6
33	MIDWAY_PS (70286) – FULLER (73477) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70/73	478	PSCo	91.7	106.8	15.1
34	COMANCHE (70122) – HUCKLBRY (77300) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70	358	TSGT	88.2	106.6	18.4
35	BOONE (70061) – COMANCHE (70122) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70	319	PSCo	80.3	101.1	20.8
36	MIDWAY_PS (70286) – MIRASOL (70652) 230 kV CKT 1	P7_55 (Lines: 7015 7017)	70	555	PSCo	82.7	100.3	17.6

Table 6– South Colorado – Multiple Contingency Voltage Violations

Ref. No.	Bus Name	Bus Number	Voltage (kV)	Area	Contingency Name	Benchmark Case Contingency Voltage (p.u.)	Study Case Contingency Voltage (p.u.)	Voltage Difference (p.u.)
1	ALMSA_TM	70025	115	70	BF_128f	0.8856	0.8739	-0.0117
2	BLANCA_PEAK	70937	115	70	BF_128f	0.8859	0.8742	-0.0117
3	ALAMOSA_SLR	700180	115	70	BF_128f	0.8859	0.8742	-0.0117
4	MIDWAY_PS	70465	345	70	P7_55	0.9427	0.8956	-0.0471

Table 7– South Colorado – Multiple Contingency Divergences

Ref. No.	Contingency Name	Case		Comments
		Benchmark	Study	
1	P7_51	Converged	Diverged	Multiple contingency divergences are mitigated using system adjustments, including generation redispatch and/or operator actions.

3.8 Stability Analysis Results

The results of the transient stability analysis are summarized in Table 8.

All simulated contingencies demonstrated the following performance:

- ✓ No machines lost synchronism with the system.
- ✓ No voltage drop violations were observed.
- ✓ Machine rotor angles displayed positive damping.

The stability plots for are provided in Appendix B in Section 8.0 of this report.

Table 8 – Transient Stability Analysis Results

Ref. No.	Fault Location	Fault Category	Outage(s)	Clearing Time (Cycles)	Post-Fault Voltage Recovery	Angular Stability
1	-	P0	Flat Run	-	Stable	Stable
2	Boone - Comanche 230 kV Ckt 1	P1	Boone - Comanche 230 kV Ckt 1	5 cycles	Stable	Stable
3	CFIF - Comanche 230 kV Ckt 1	P1	CFIF - Comanche 230 kV Ckt 1	5 cycles	Stable	Stable
4	Comanche - Mirasol 230 kV Ckt 1	P1	Comanche - Mirasol 230 kV Ckt 1	5 cycles	Stable	Stable
5	Comanche - Comanche Solar 230 kV Ckt 1	P1	Comanche - Comanche Solar 230 kV Ckt 1 Comanche Solar Gen S1	5 cycles	Stable	Stable
6	Comanche - Huckleberry 230 kV Ckt 1	P1	Comanche - Huckleberry 230 kV Ckt 1	5 cycles	Stable	Stable
7	Comanche - GI_2020_10 POI 230 kV Ckt 1	P1	Comanche - GI_2020_10 POI 230 kV Ckt 1	5 cycles	Stable	Stable
8	Comanche - Sun Mountain 230 kV Ckt 1	P1	Comanche - Sun Mountain 230 kV Ckt 1 Sun Mountain Gen S1	5 cycles	Stable	Stable
9	Bighorn Solar - Comanche 230 kV Ckt 1	P1	Bighorn - Comanche 230 kV Ckt 1 Bighorn Solar Gen S1	5 cycles	Stable	Stable
10	Comanche - REPL_2024 230 kV Ckt 1	P1	Comanche - REPL_2024 230 kV Ckt 1 REPL_2021 Gens REPL_2024 Gens	5 cycles	Stable	Stable
11	Comanche 230 kV Bus	P1	Comanche Gen C2 & Load	5 cycles	Stable	Stable
12	Comanche 230 kV Bus	P1	Comanche 230 kV - Comanche 115 kV Transformer T1	5 cycles	Stable	Stable
13	Comanche 230 kV Bus	P1	Comanche 345 kV - Comanche 230 kV Transformer T3	5 cycles	Stable	Stable
14	Comanche 230 kV Bus	P1	Comanche 230 kV - Comanche 115 kV Transformer T2	5 cycles	Stable	Stable
15	Comanche 039e Stuck	P4	Comanche - Tundra 345 kV Ckt 1 Comanche 345 kV - Comanche 230 kV Transformer T4	12 cycles	Stable	Stable

Ref. No.	Fault Location	Fault Category	Outage(s)	Clearing Time (Cycles)	Post-Fault Voltage Recovery	Angular Stability
16	Comanche 039g Stuck	P4	Comanche 345 kV - Comanche 230 kV Transformer T3 Comanche 345 kV SVD	12 cycles	Stable	Stable
17	Comanche 039i Stuck	P4	Comanche 345 kV - Comanche 230 kV Transformer T3 Comanche 230 kV - Comanche 115 kV Transformer T2	12 cycles	Stable	Stable
18	Comanche 039m Stuck	P4	Comanche 230 kV - Comanche 115 kV Transformer T1 Comanche - CF&I SE1 115 kV Ckt 1 Comanche - Reader 115 kV Ckt 1	17 cycles	Stable	Stable
19	Comanche 039o Stuck	P4	Comanche 115 kV Bus Tie Comanche 230 kV - Comanche 115 kV Transformer T1 Comanche - CF&I SE1 115 kV Ckt 1 Comanche - Reader 115 kV Ckt 1 Comanche 230 kV - Comanche 115 kV Transformer T2 Comanche - Reader 115 kV Ckt 2 Comanche - CF&I SE2 115 kV Ckt 1	17 cycles	Stable	Stable
20	Comanche - GI_2020_10 POI 230 kV Ckt 1	P7	Comanche - GI_2020_10 POI 230 kV Ckt 1 GI_2020_10 POI - Mirasol 230 kV Ckt 1 Comanche - Huckleberry 230 kV Ckt 1 Huckleberry - Walsenburg 230 kV Ckt 1	5 cycles	Stable	Stable

3.9 Short-Circuit (Breaker Duty) Analysis Results

A study was completed to determine whether any over-dutied breakers resulted when several Provisional Interconnections (PIs) were added to the PSCo transmission system in the order of their In-Service Date (ISD). If the addition of the generator interconnection resulted in a requirement that one or more breakers be replaced on the PSCo transmission system, it was considered that that customer would not be able to connect under a Provisional Interconnection agreement and it was removed from the study.

Taken into consideration were any existing plans for breaker replacement by PSCo. Breakers that had already been assigned to projects were not considered as needing replacement by the interconnection customer.

The short-circuit (breaker duty) analysis of the PSCo transmission system identified two circuit breakers at Midway 230 kV (5129 and 9636) and one circuit switcher at CF&I Furnace 230 kV (5409) as over-dutied due to the addition of PI-2026-1.

Additionally, the fault currents at the POI can be made available upon request by the Customer.

3.10 Affected Systems

No Affected Systems were identified.

4.0 Cost Estimates

The total estimated cost of the required Upgrades for PI-2026-1 to interconnect for Provisional Interconnection Service at the Comanche 230 kV switching station $0.450 million.

- **Cost of Transmission Provider's Interconnection Facilities (TPIF) is $0 million**
- **Cost of Station Network Upgrades is $0.450 million (Table 9)**
- **Cost of System Network Upgrades is $0**

The list of improvements required to accommodate the Provisional Interconnection of PI-2026-1 are given in Table 9.

Table 9 – Station Network Upgrades

Element	Description	Cost Est. (Million)
PSCo's Comanche 230 kV substation	Interconnection of PI-2026-01 at the Comanche 230 kV switching station. The new equipment and scope includes: • (1) AGC RTU • Relay Settings • COMM Settings • DFR Settings • Metering Setting Updates	$0.450
Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities		**$0.450**

PSCo has developed cost estimates for Transmission Provider's Interconnection Facilities and Network/Infrastructure Upgrades required for the interconnection of PI-2026-1 for Provisional Interconnection Service. The estimated costs provided in this report are based upon the following assumptions:

- The estimated costs are in 2026 dollars with escalation and contingencies applied.
- Allowances for Funds Used During Construction (AFUDC) is not included.
- The estimated costs include all applicable labor and overheads associated with the siting, engineering, design, and construction of these new PSCo facilities.
- The estimated costs do not include the cost for any Customer owned equipment and associated design and engineering.
- Labor is estimated for straight time only—no overtime included.

- PSCo (or its Contractor) will perform all construction, wiring, testing, and commissioning for PSCo owned and maintained facilities.

The customer requirements include:

- Interconnection Customer will install two (2) redundant fiber optic circuits (one primary circuit with a redundant backup) into the Transmission Provider's switching station as part of its interconnection facilities construction scope.
- Power Quality Metering (PQM) will be required on the Customer's generation tie-line terminating into the POI.
- The Customer will be required to design, procure, install, own, operate and maintain a Remote Terminal Unit (RTU) at their Customer substation. PSCo will be provided with indications, readings and data from the RTU.
- The Interconnection Customer will comply with the most current version of the *Interconnection Guidelines for Transmission Interconnected Producer-Owned Generation Greater Than 20 MW*, as amended from time to time, and available at: Interconnection | Transmission | Corporate | Xcel Energy

4.1 Schedule

This section provides proposed milestones for the interconnection of PI-2026-1 to the Transmission Provider's Transmission System. The customer requested a back-feed date (In-Service Date for Transmission Provider Interconnection Facilities and Station Network Upgrades required for interconnection) for the Provisional Interconnection is June 26, 2026. This is attainable by the Transmission Provider, based upon the current schedule developed for this interconnection request. The Transmission Provider proposes the milestones provided below in Table 10.

Table 10 – Proposed Milestones for PI-2026-1

Milestone	Responsible Party	Estimated Completion Date
In-Service Date for Transmission Provider Interconnection Facilities and Station Network Upgrades required for interconnection	Transmission Provider	06/26/2026
In-Service Date & Energization of Interconnection Customer's Interconnection Facilities	Interconnection Customer	06/26/2026
Initial Synchronization and Trial Operation Date	Interconnection Customer	07/06/2026
Begin PLGIA testing	Interconnection Customer and Transmission Provider	09/28/2026
Commercial Operation Date	Interconnection Customer	10/31/2026

Some schedule elements are outside of the Transmission Provider's control and could impact the overall schedule. The following schedule assumptions provide the basis for the schedule milestones:

- Availability of line outages to interconnect new facilities to the transmission system.

5.0 Conclusion

The total estimated cost of the PSCo transmission system improvements required for PI-2026-1 to qualify for Provisional Interconnection Service would be $0.450 million.

Based on the power flow, stability, and short-circuit analyses, the maximum allowable output for the Generating Facility is 0 MW. The short-circuit (breaker duty) analysis on the PSCo transmission system identified two breakers at Midway 230 kV (5129 and 9636) and one circuit switcher at CF&I Furnace 230 kV (5409) as over-dutied due to the addition of PI-2026-1. The output amount of the Generating Facility in the PLGIA[4] will be reviewed quarterly and updated if there are changes to the system conditions assumed in this analysis.

Security: PI-2026-1 is a request for Network Resource Interconnection Service (NRIS). For this NRIS request, security shall estimate the risk associated with the Network Upgrades and the Interconnection Facilities and is assumed to be a minimum of $25 million.

The Provisional Interconnection Service in and of itself does not convey transmission service.

6.0 Contingent Facilities

The Contingent Facilities identified for PI-2026-1 include the Station Network Upgrades identified in Table 9.

7.0 Conceptual One-Line Diagram for PI-2026-1

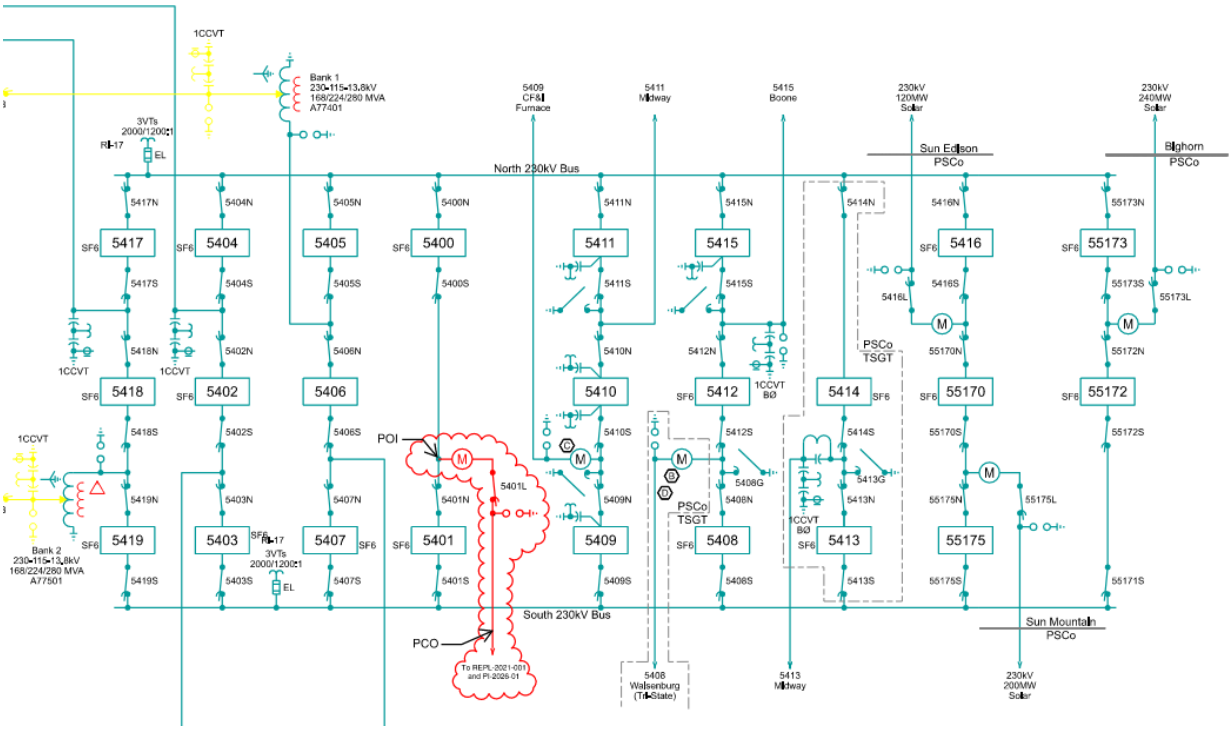
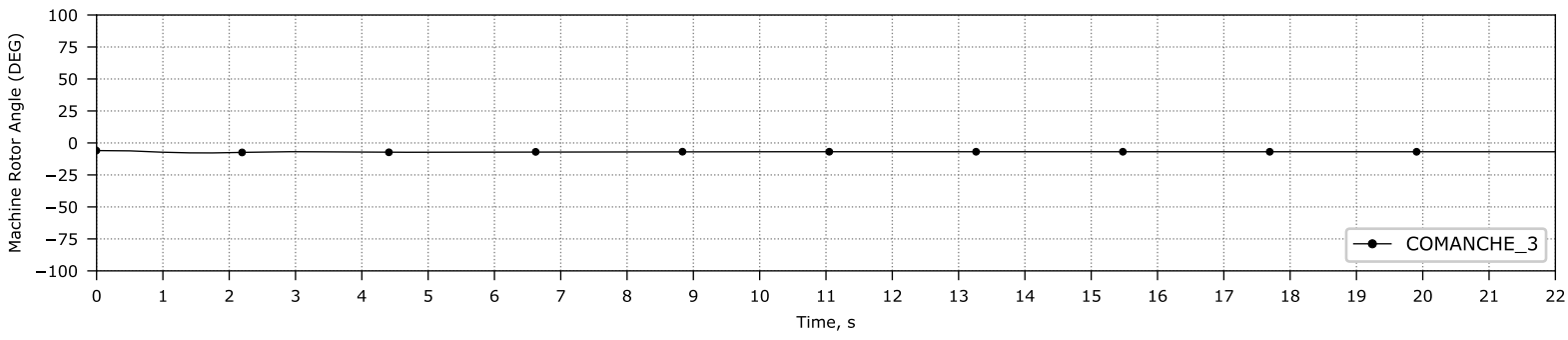


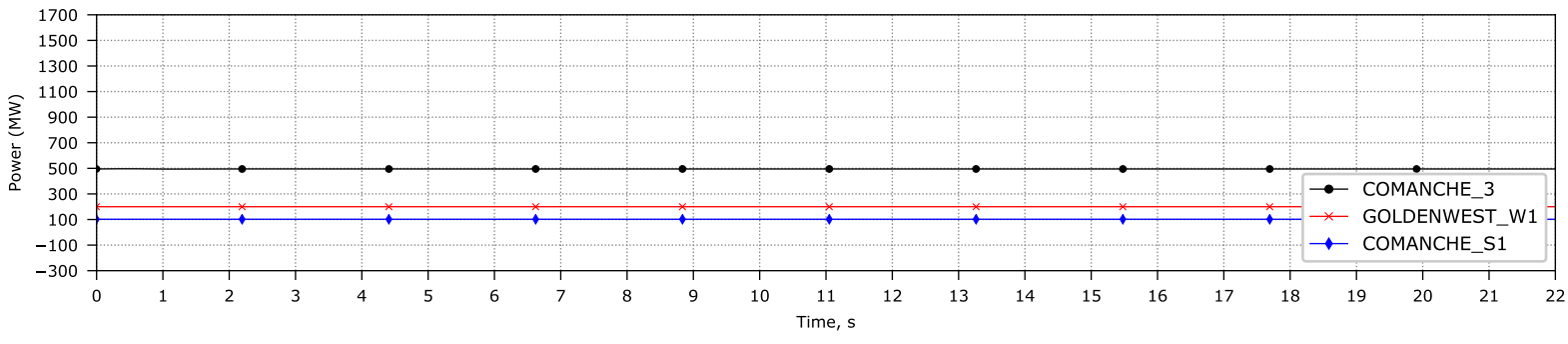
Figure 3: Preliminary One-Line of PI-2026-1 at the Comanche 230 kV Switching Station

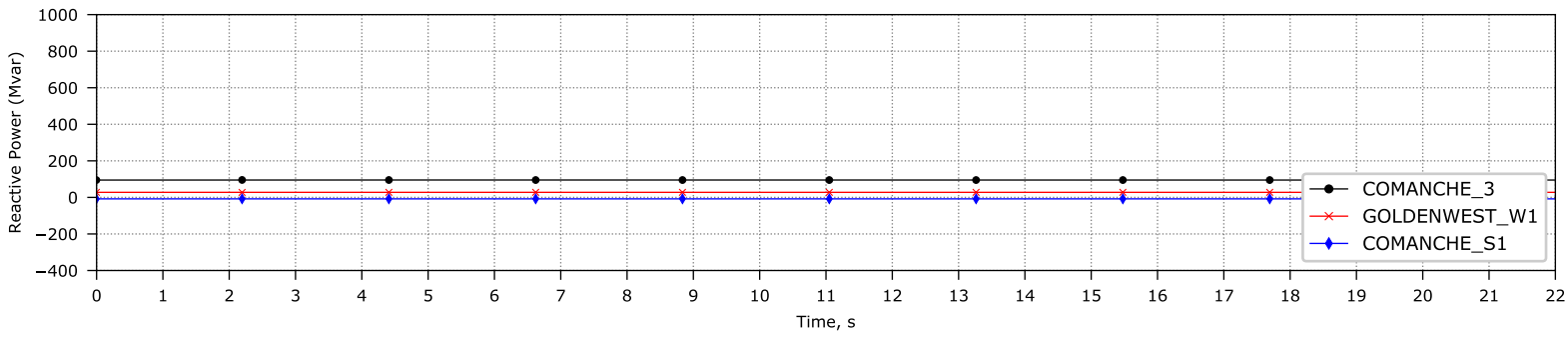
8.0 Appendices

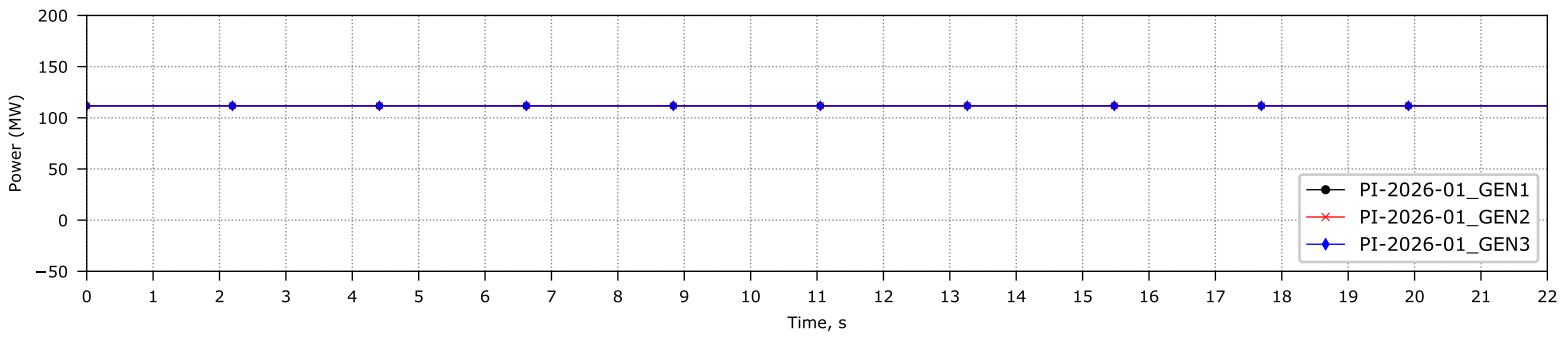
Appendix A: Modeling Files	 Arroyo 2 Solar.epc  Arroyo 2 Solar.dyd
Appendix B: Stability Plots	 PI-2026-1 Study Transient Stability Plot

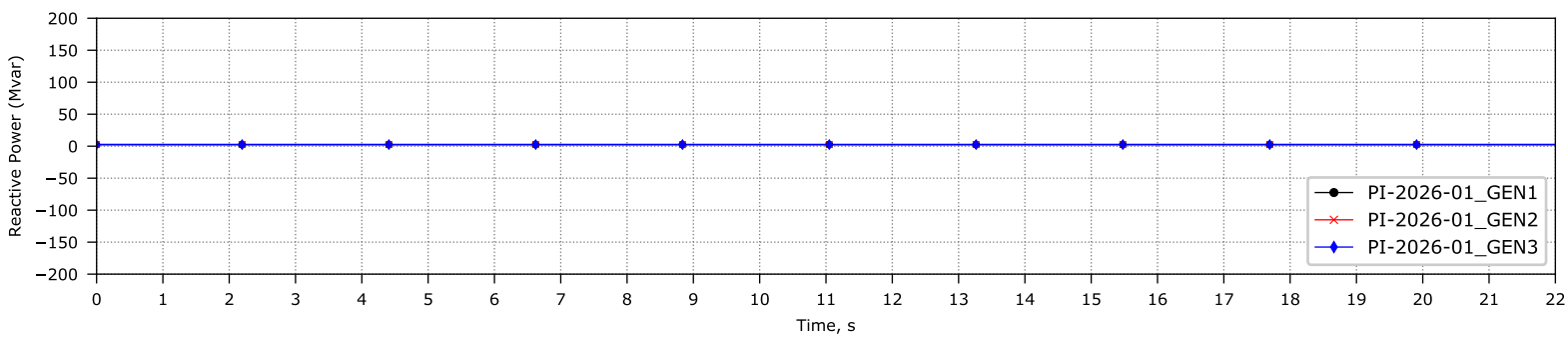
flatrun

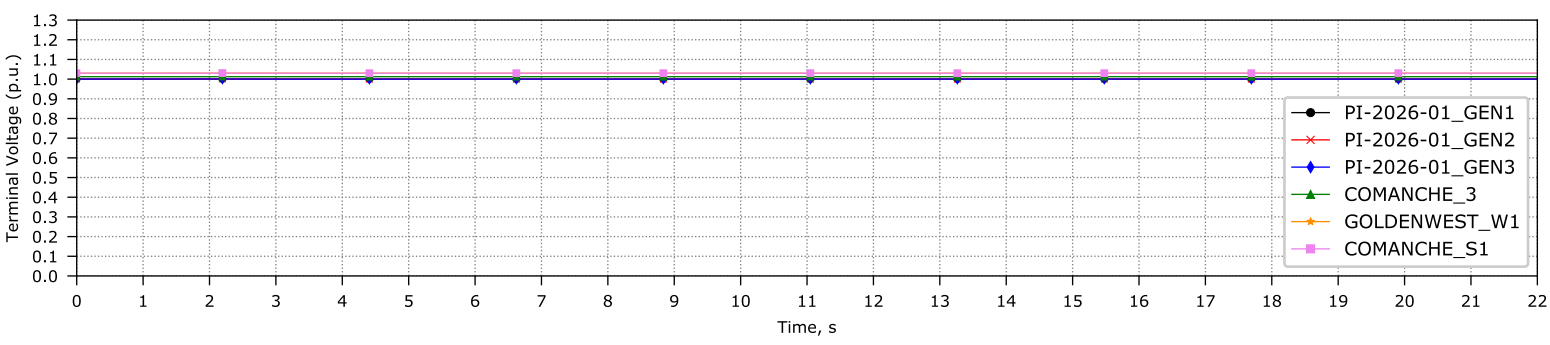

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

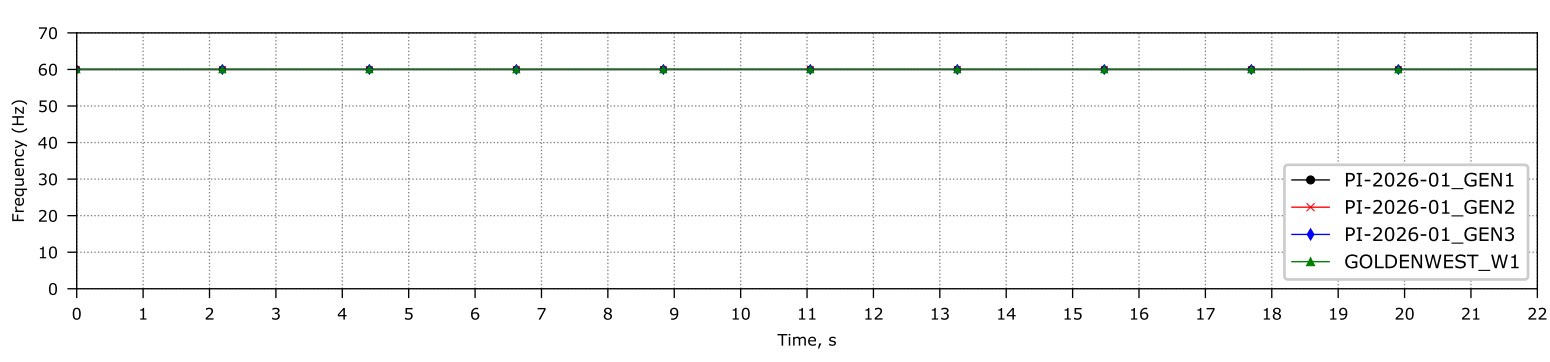

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

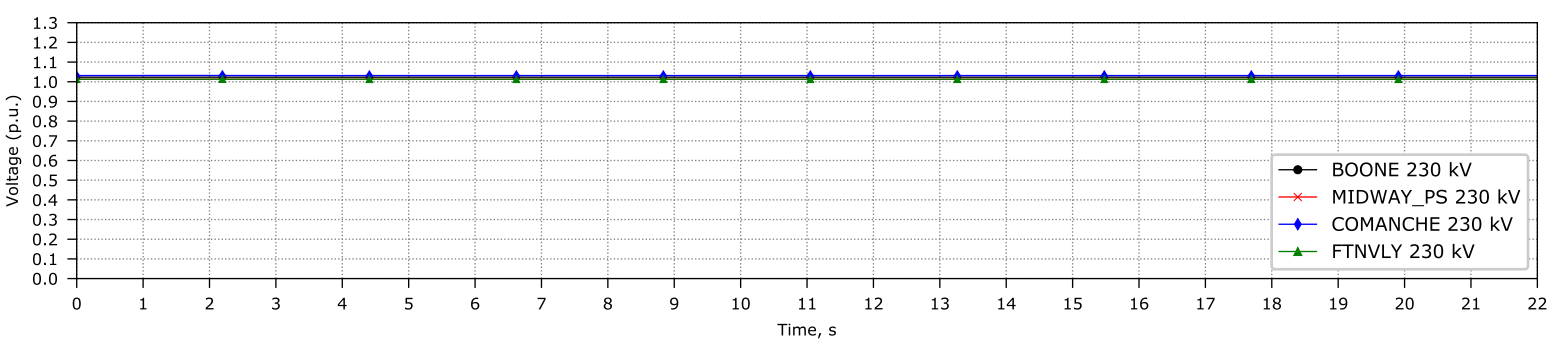

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

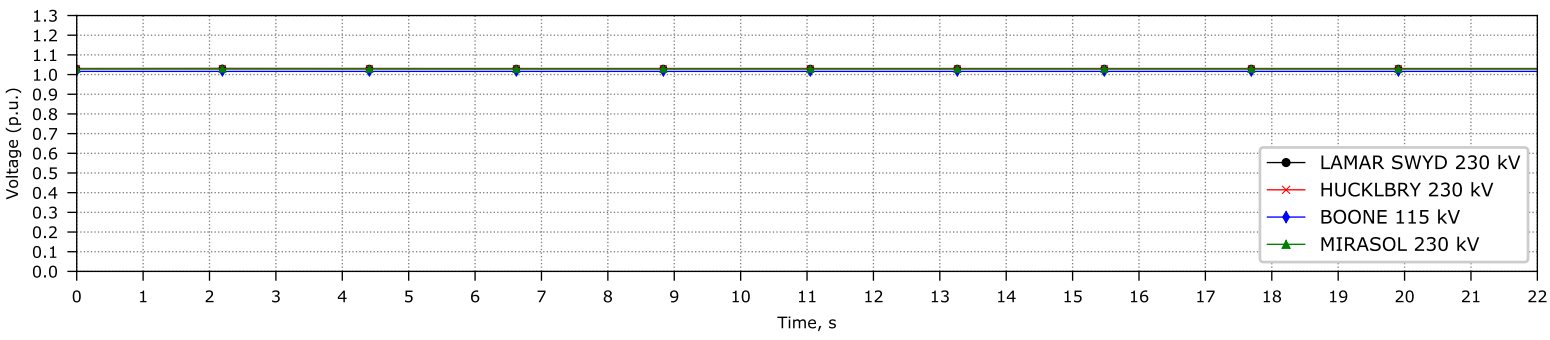

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

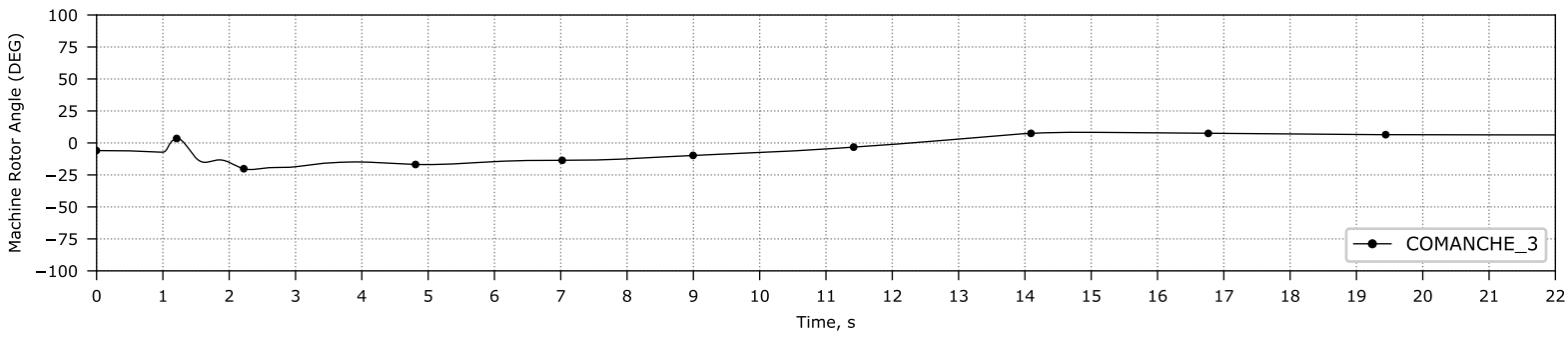

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

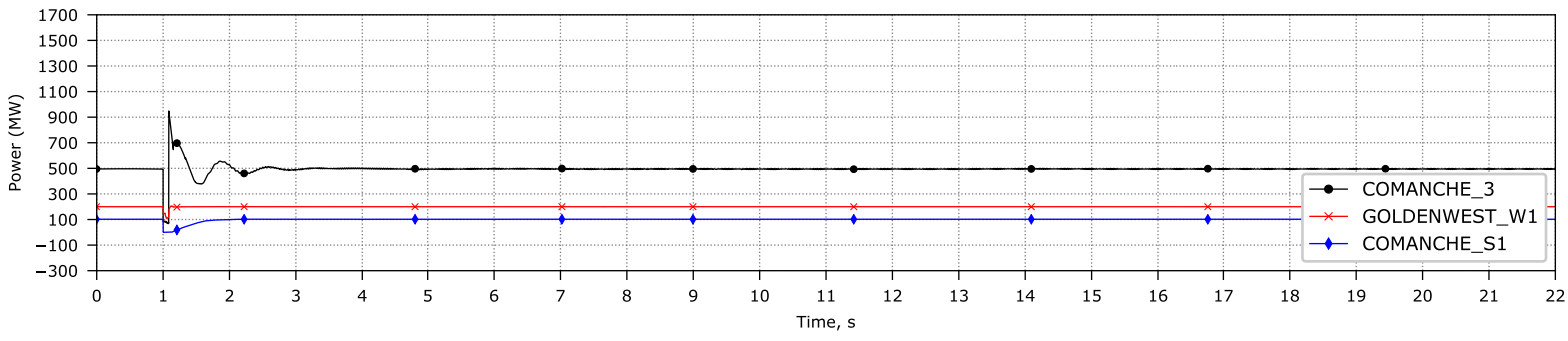

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

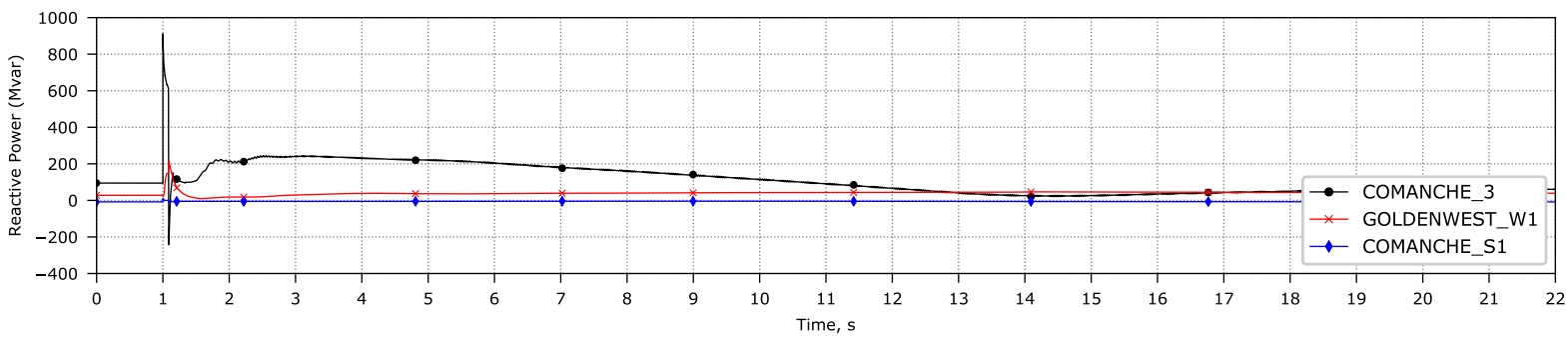

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

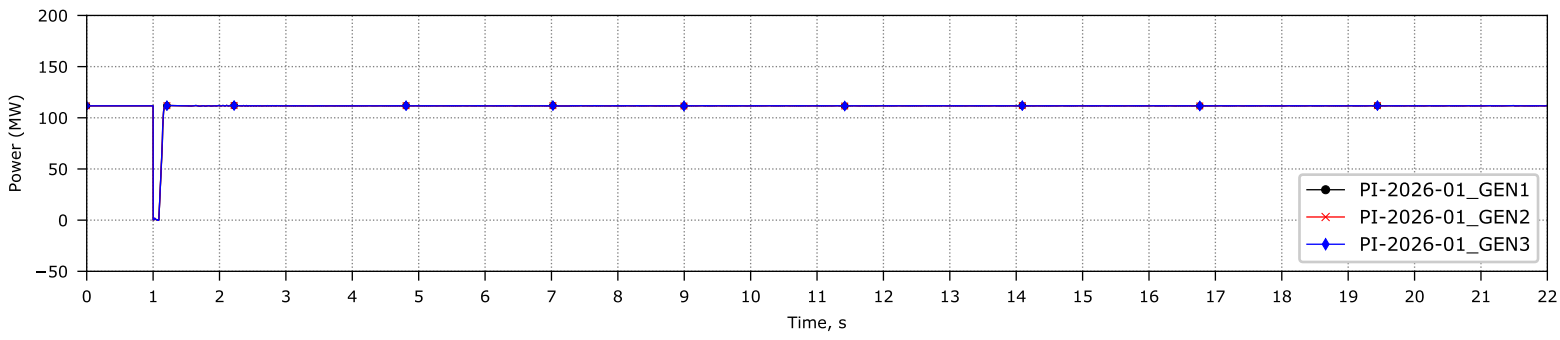

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

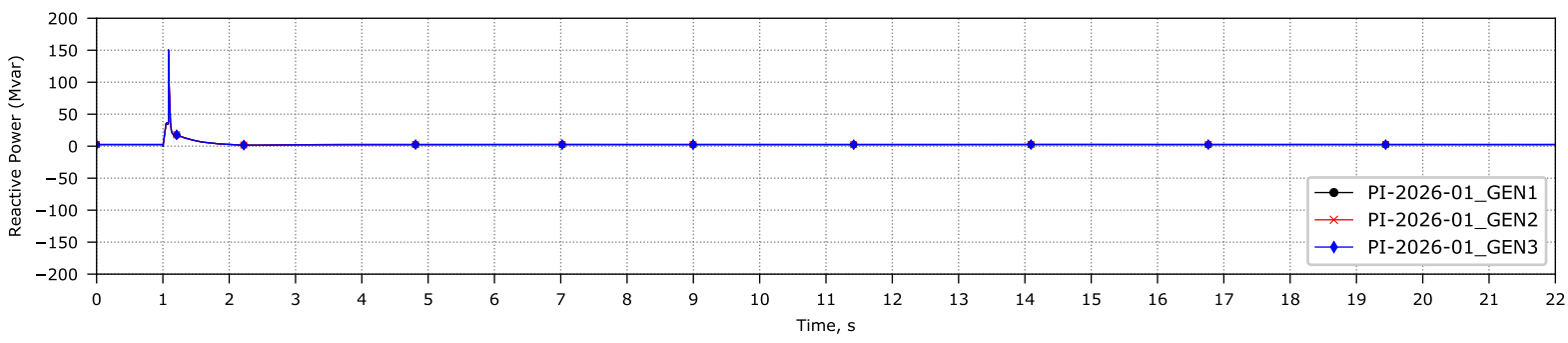
Boone-Comanche-1_230kV

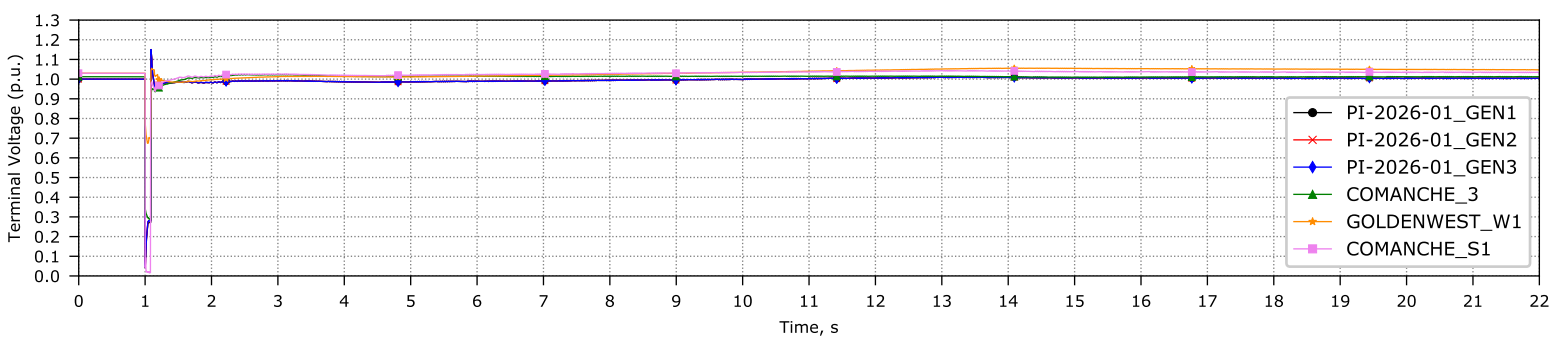


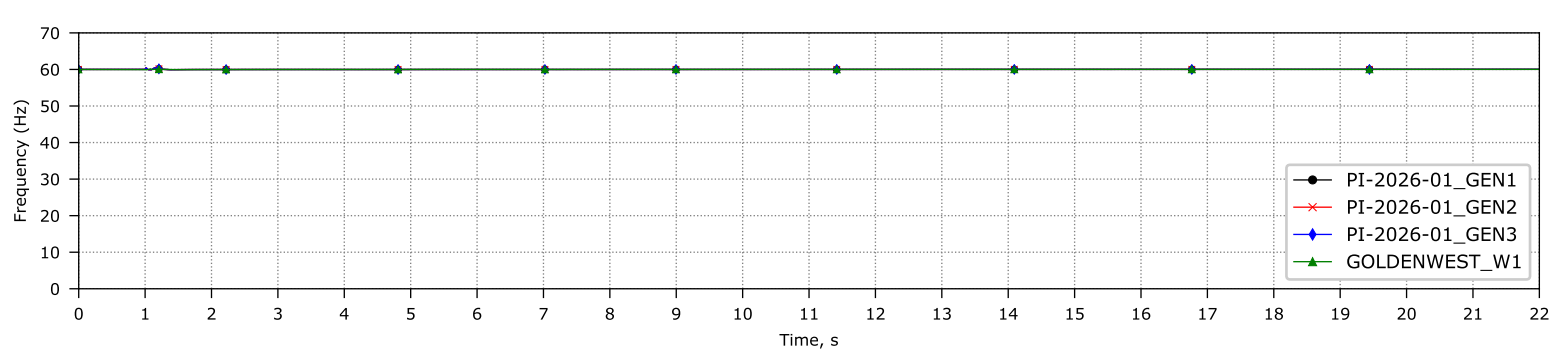


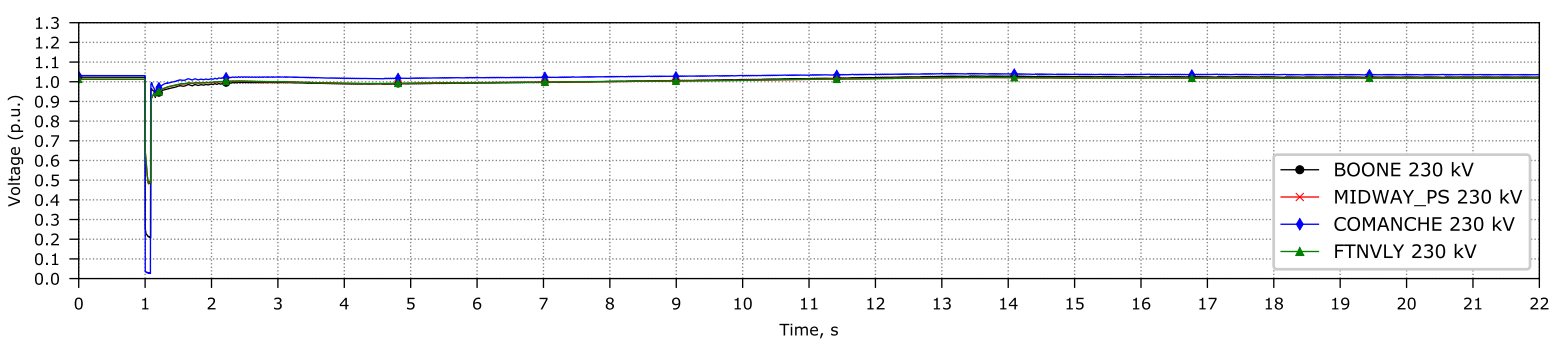


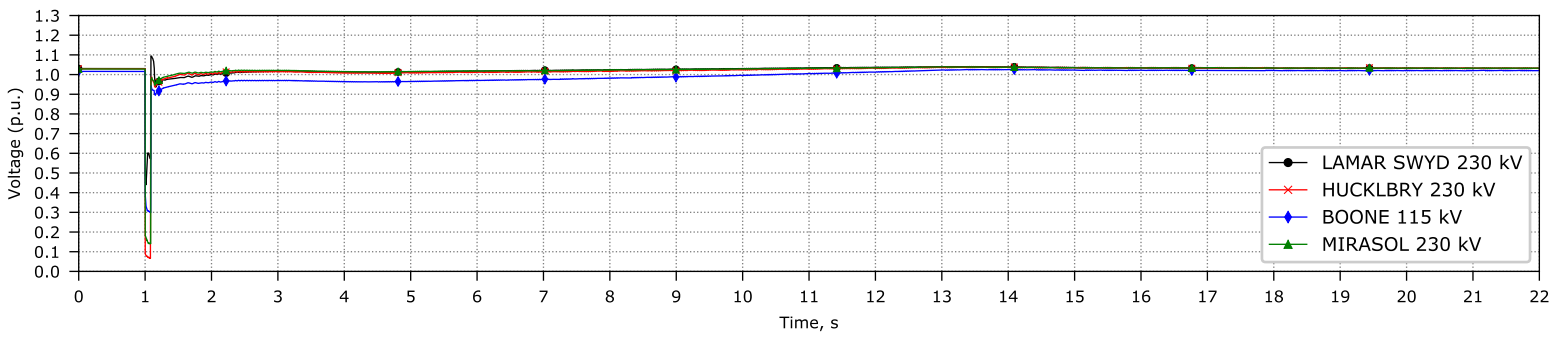




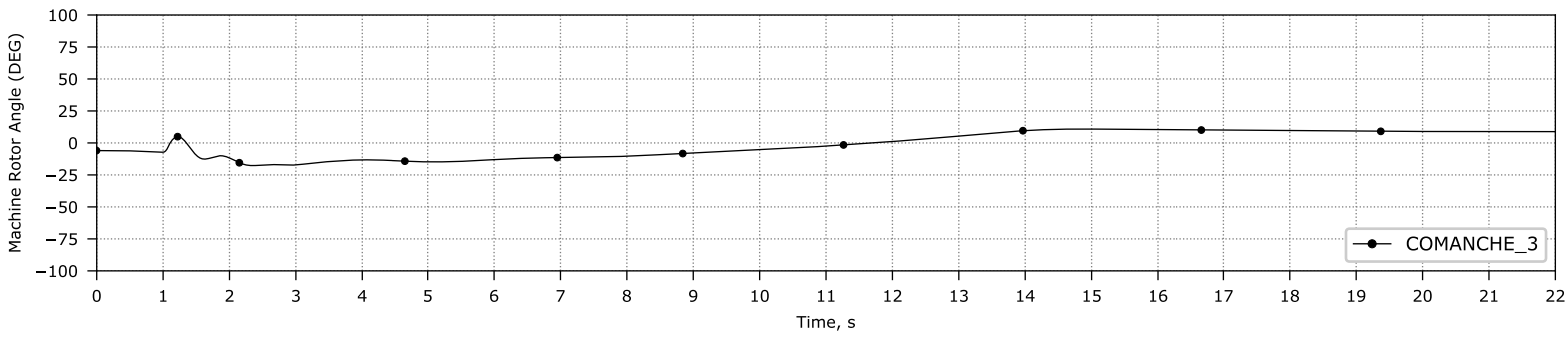


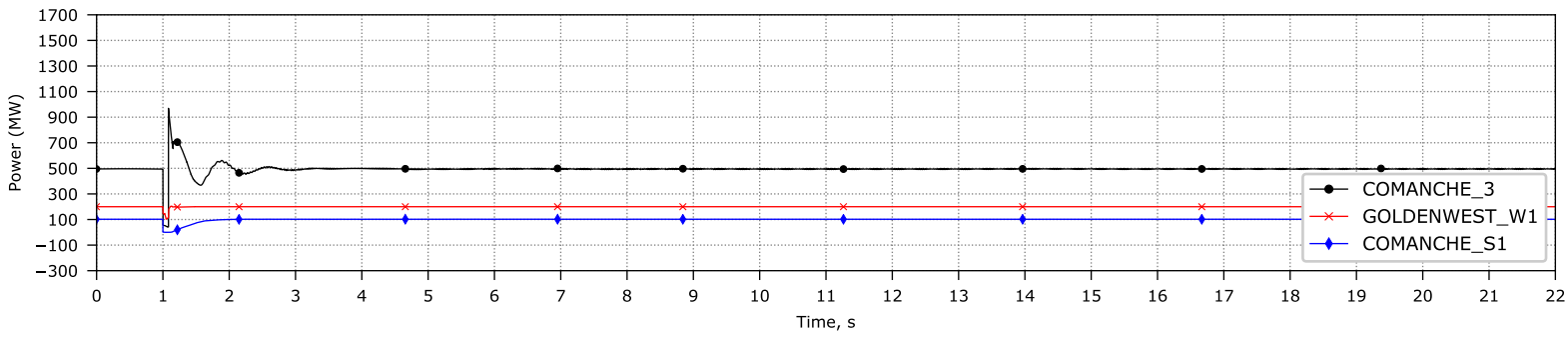


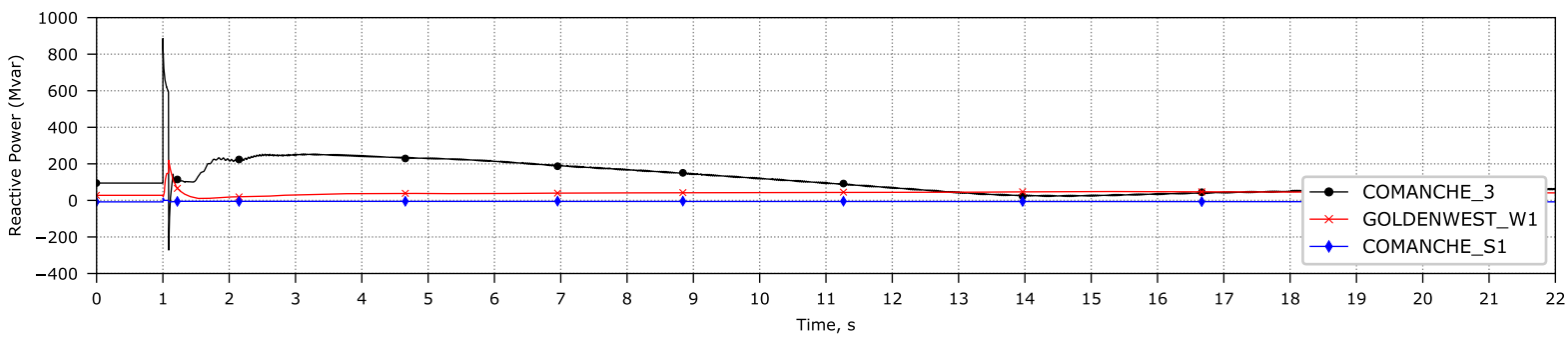


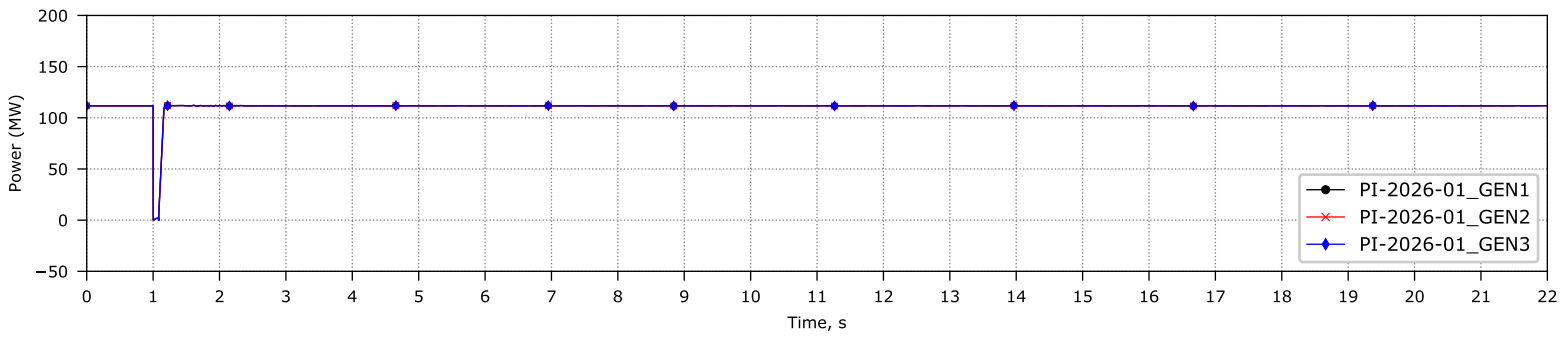


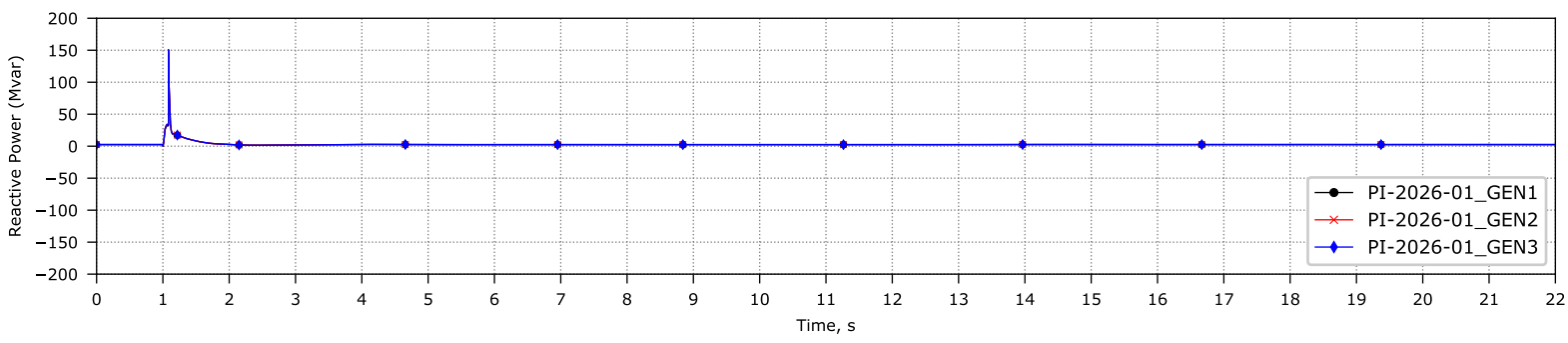
CFIF-Comanche-1_230kV

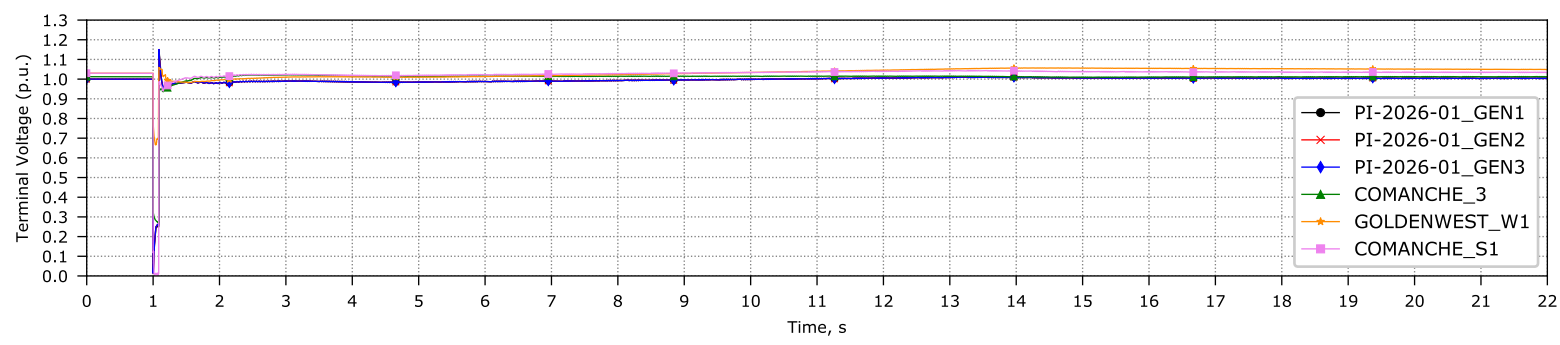


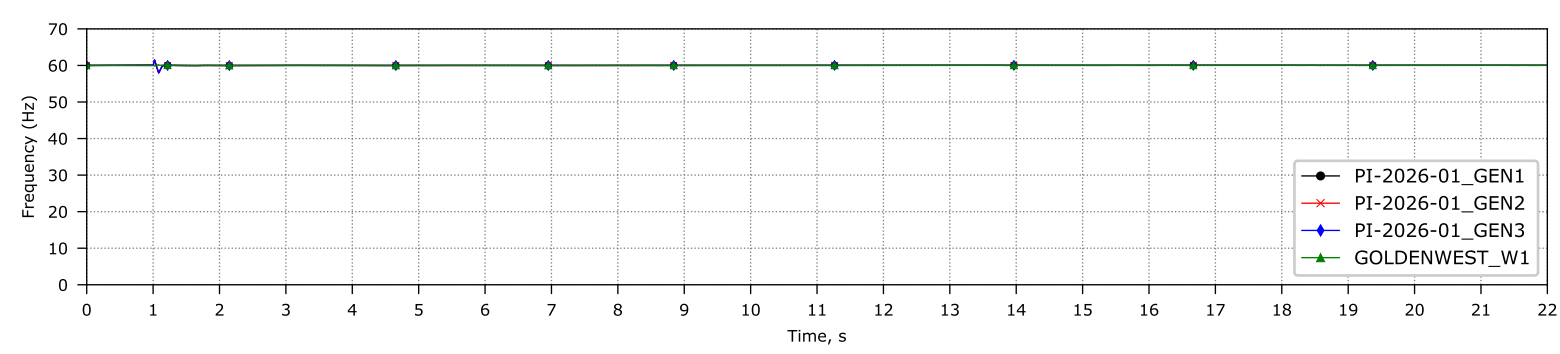


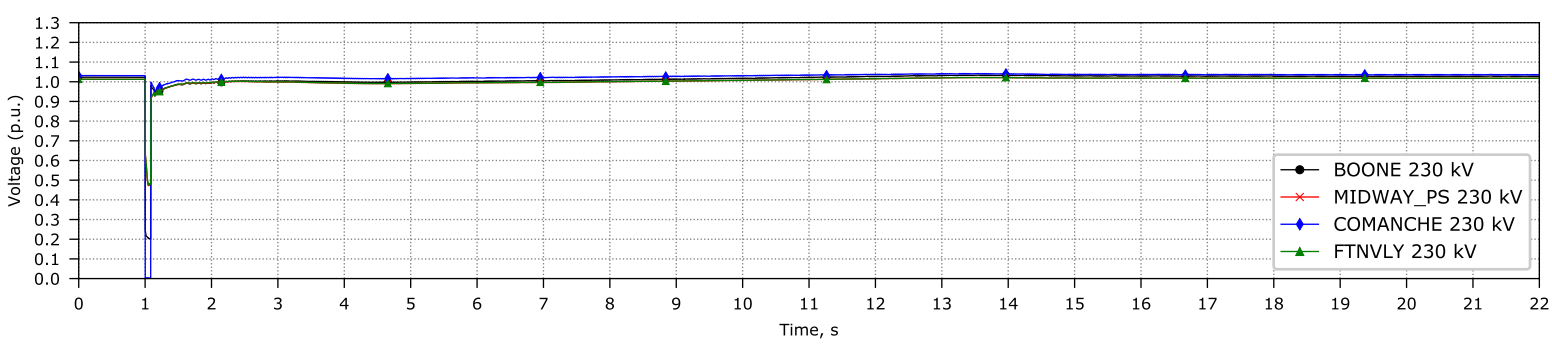


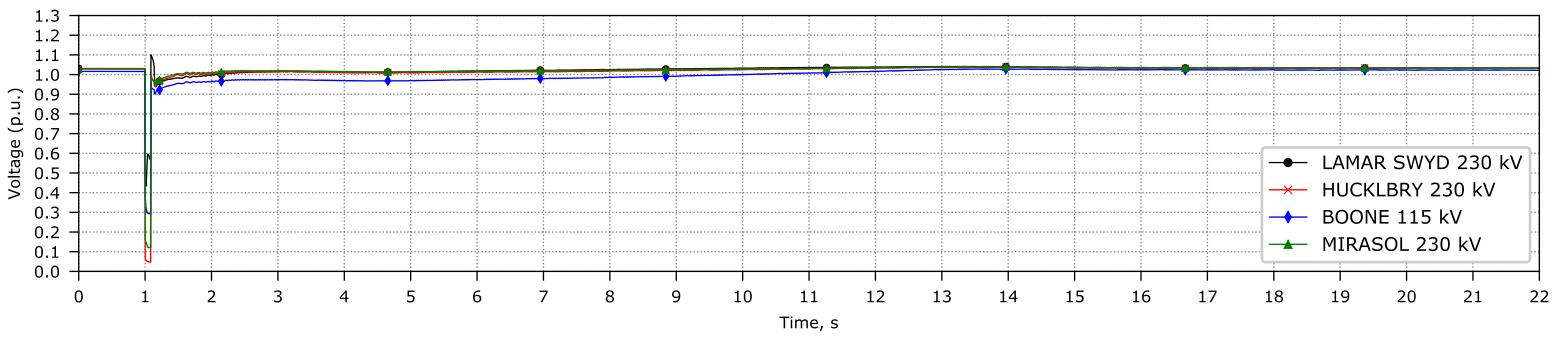




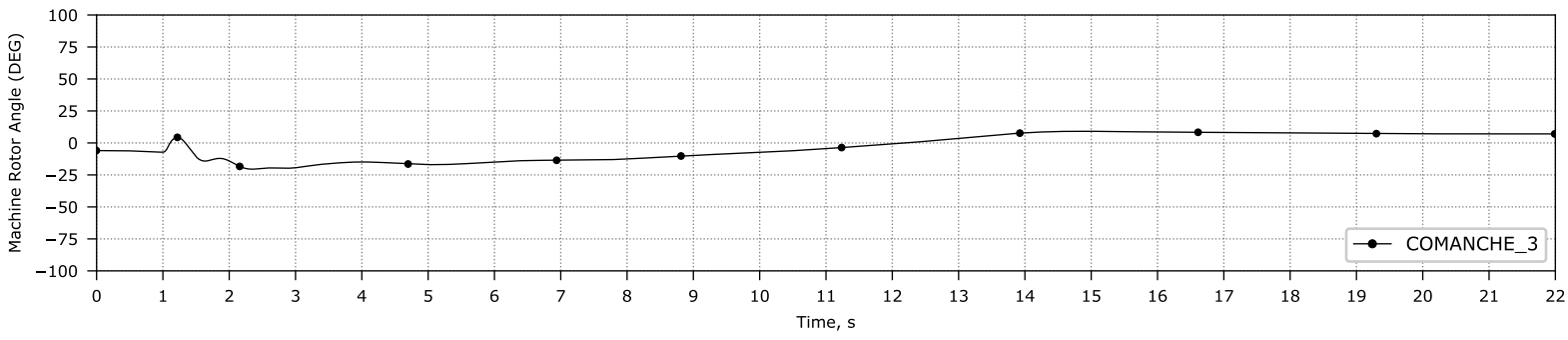


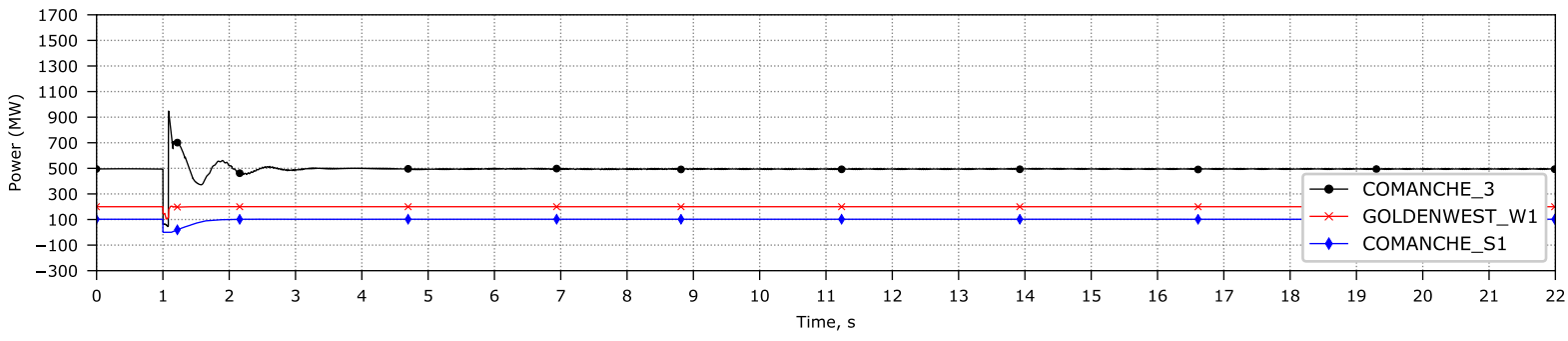


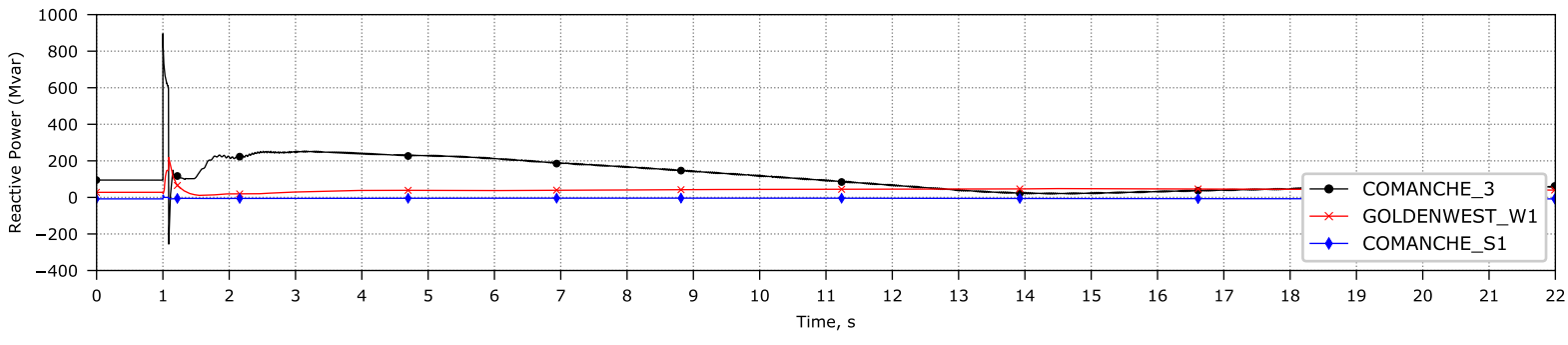


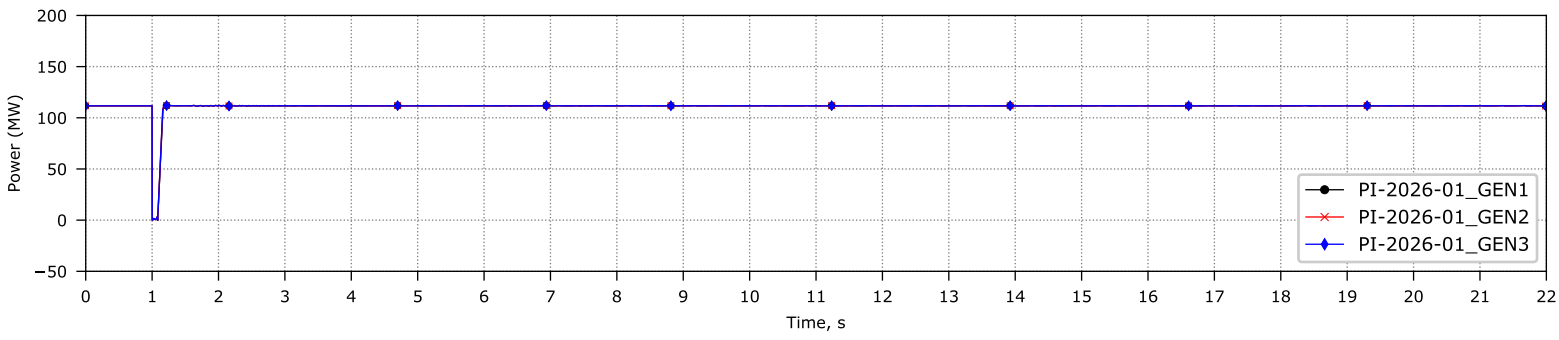


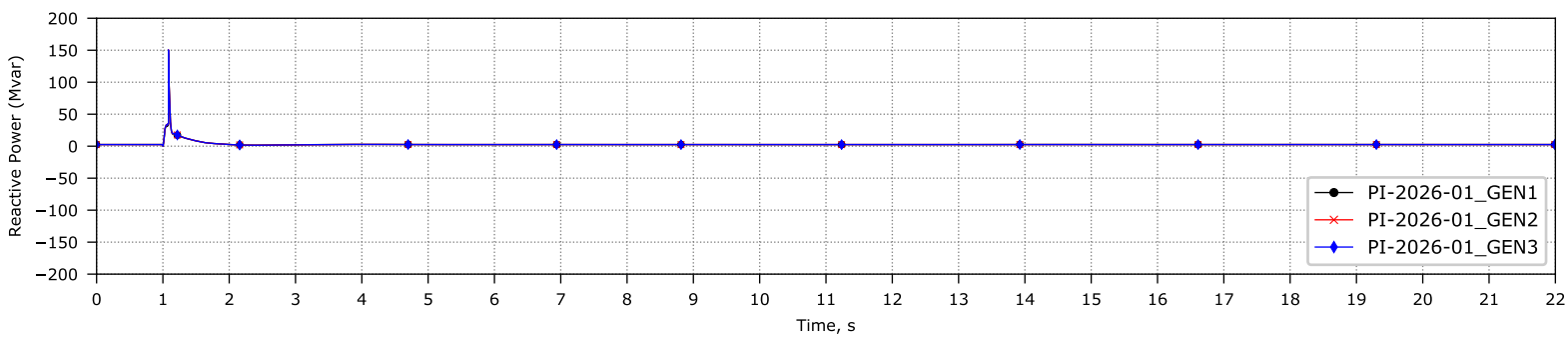
Comanche-MSOL-1_230kV

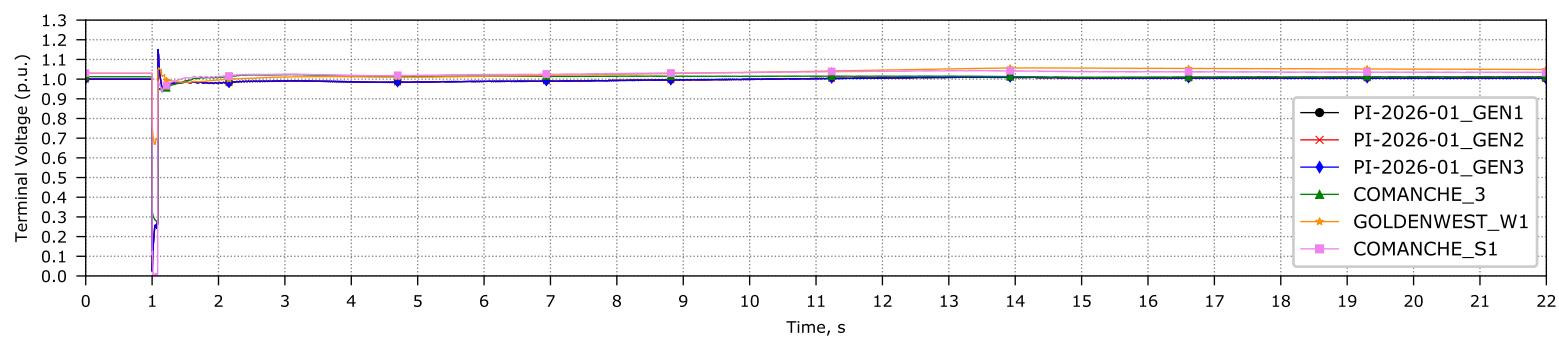


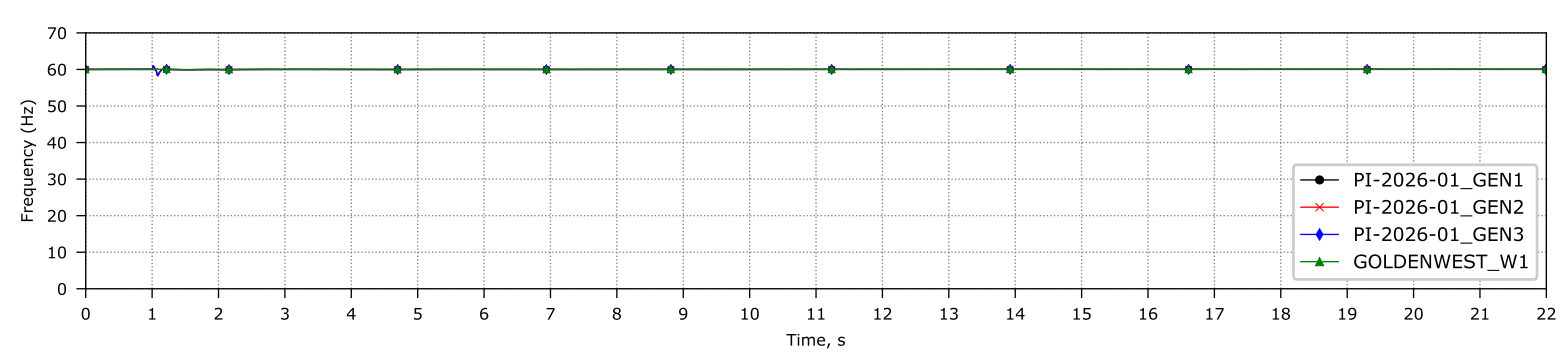


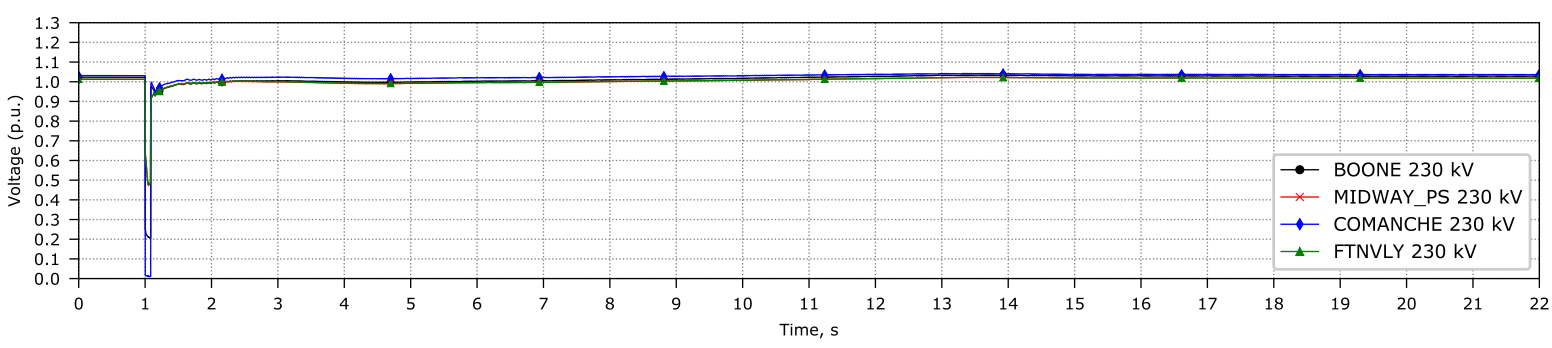


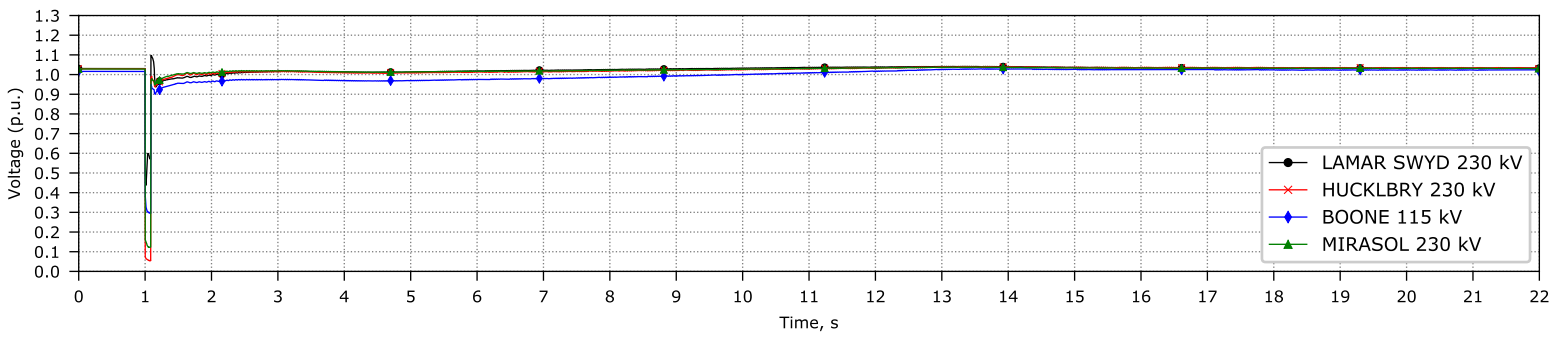




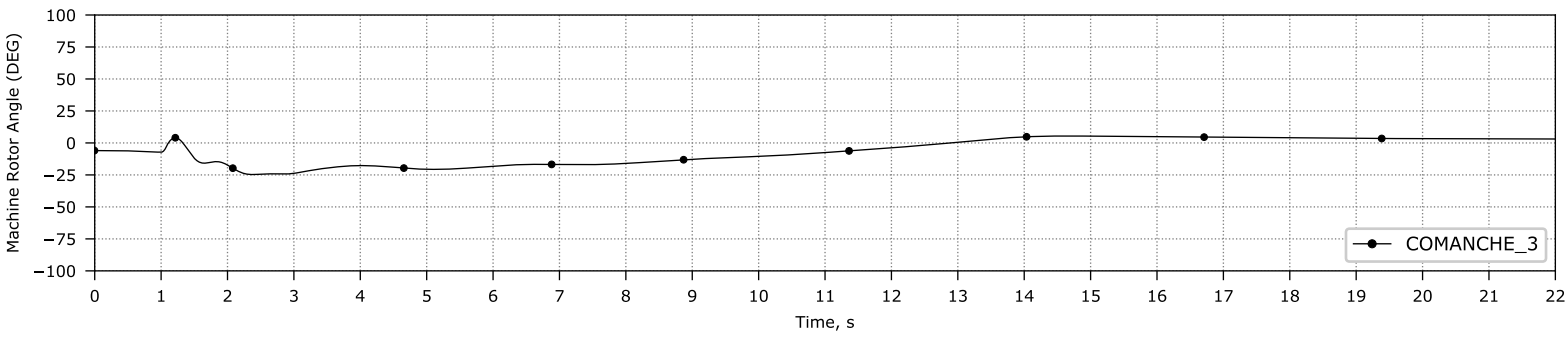


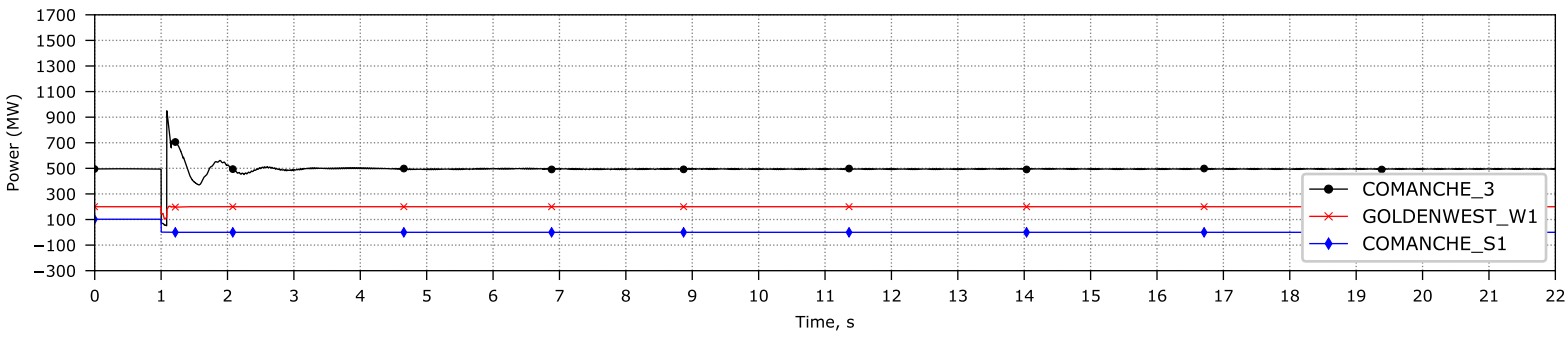


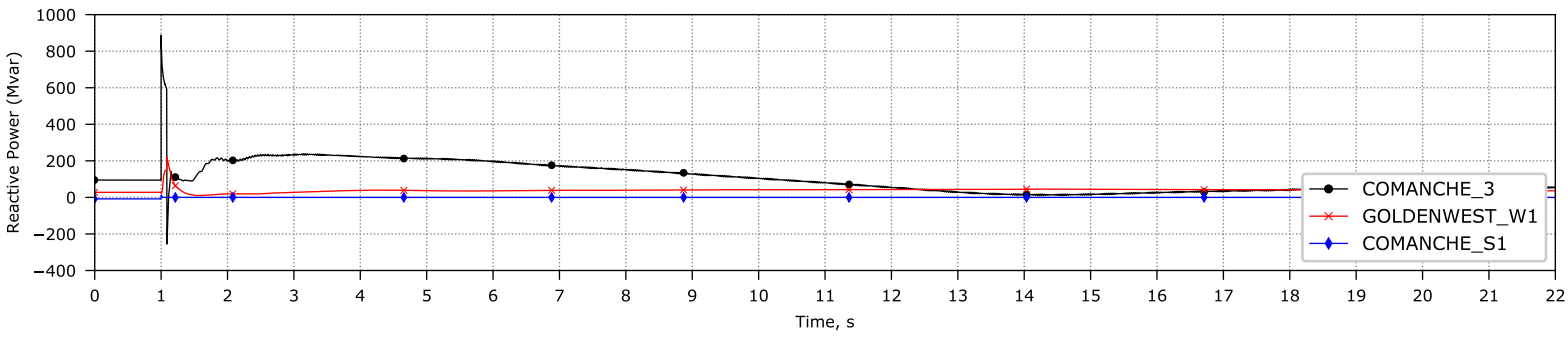


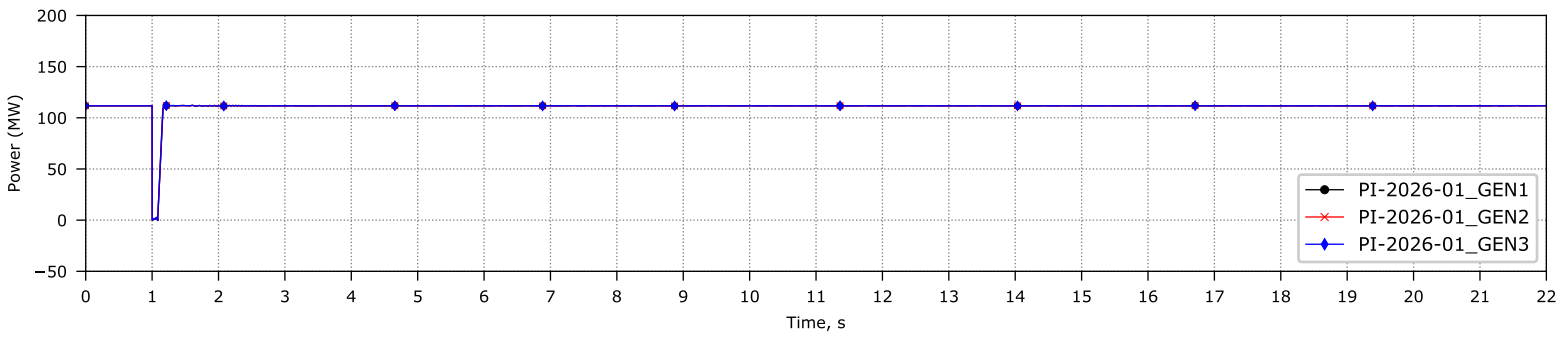


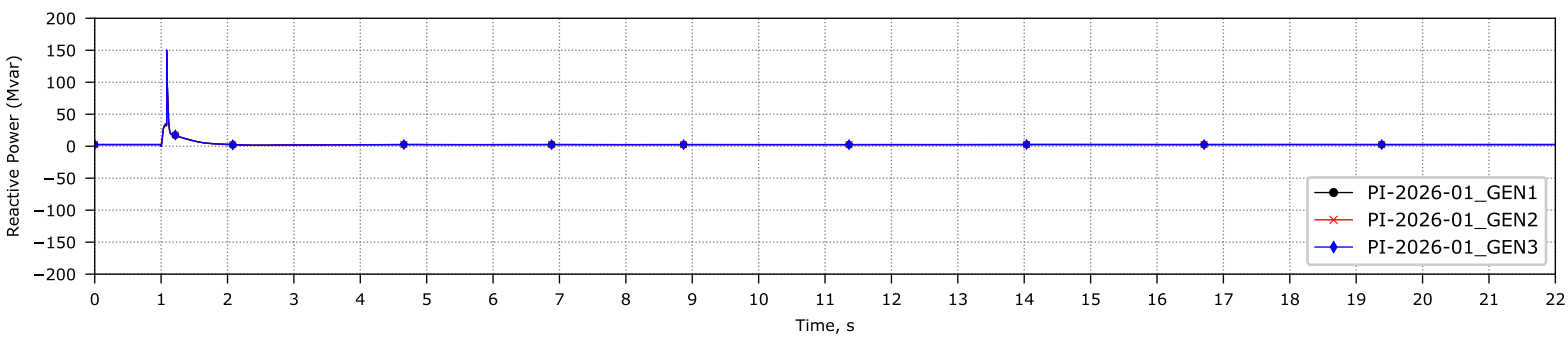
Comanche-SEDS-1_230kV

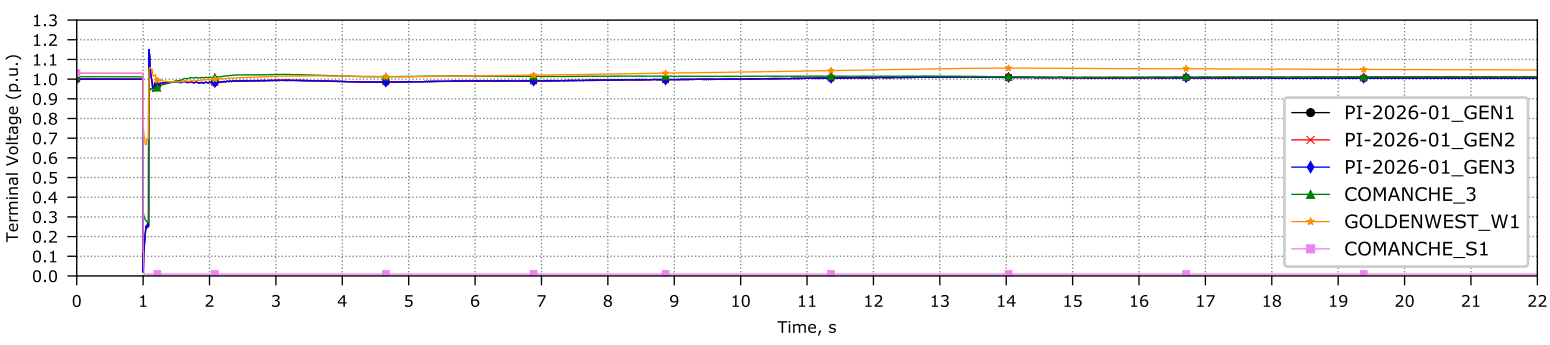


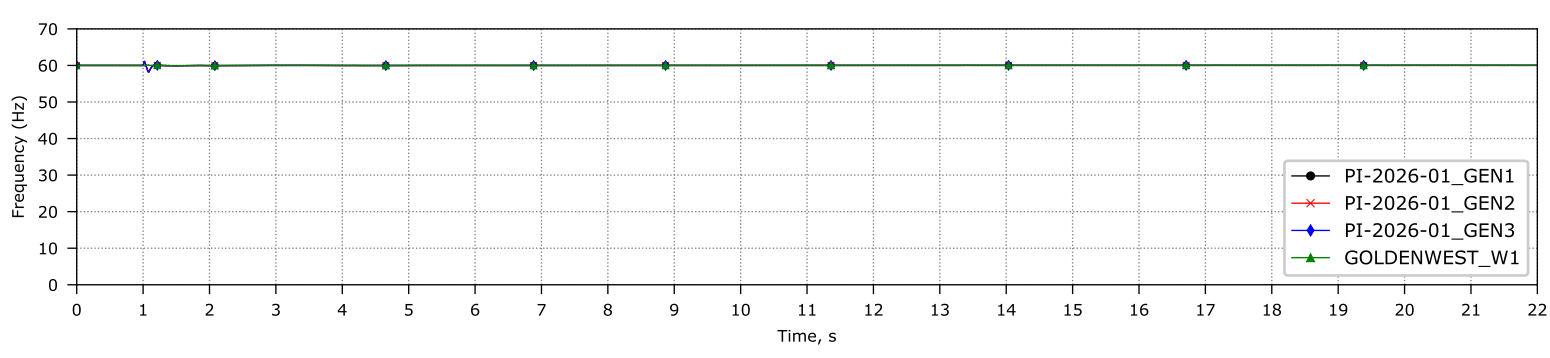


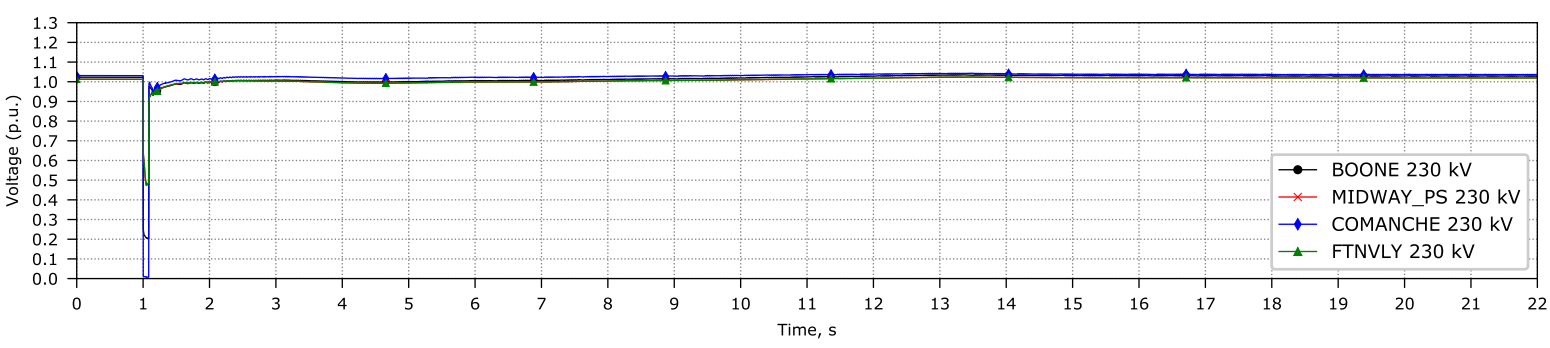


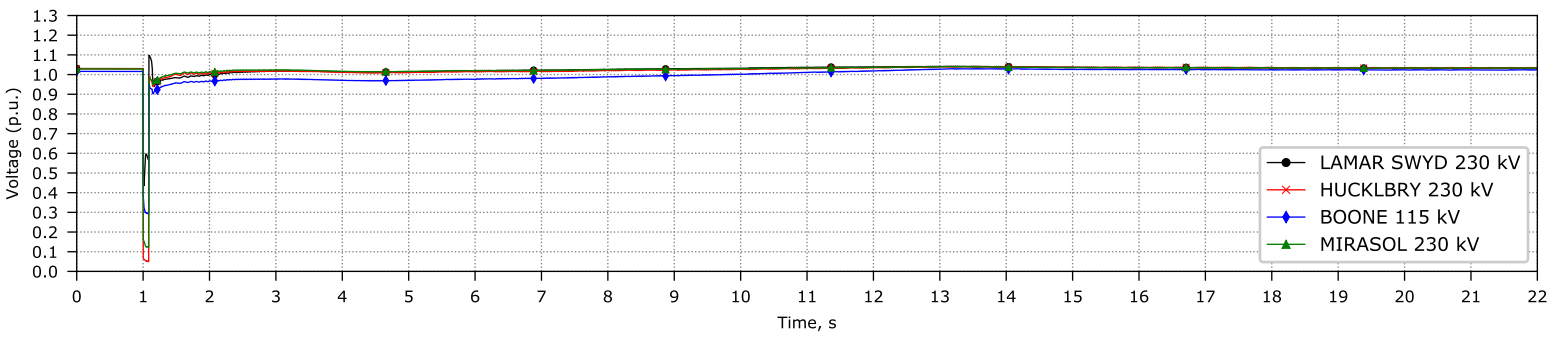




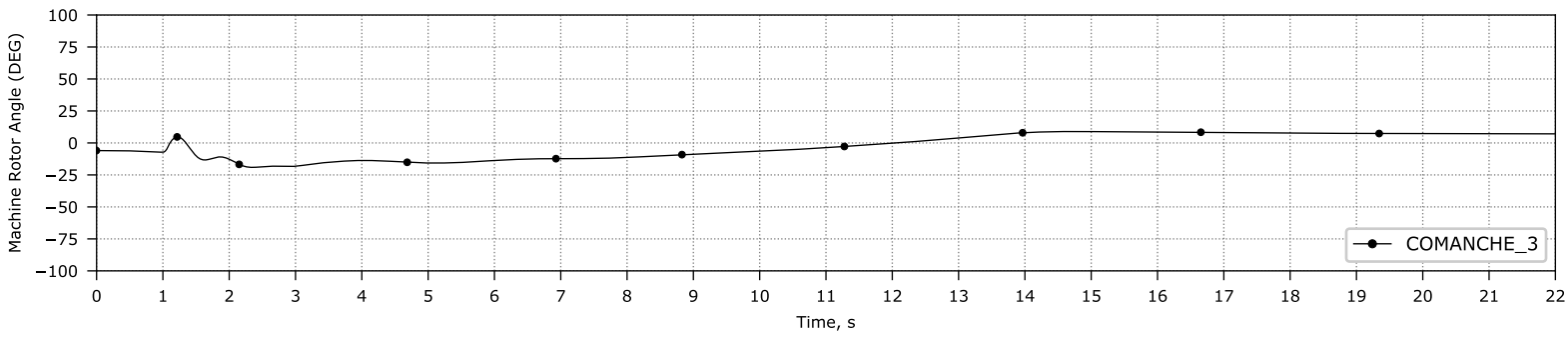


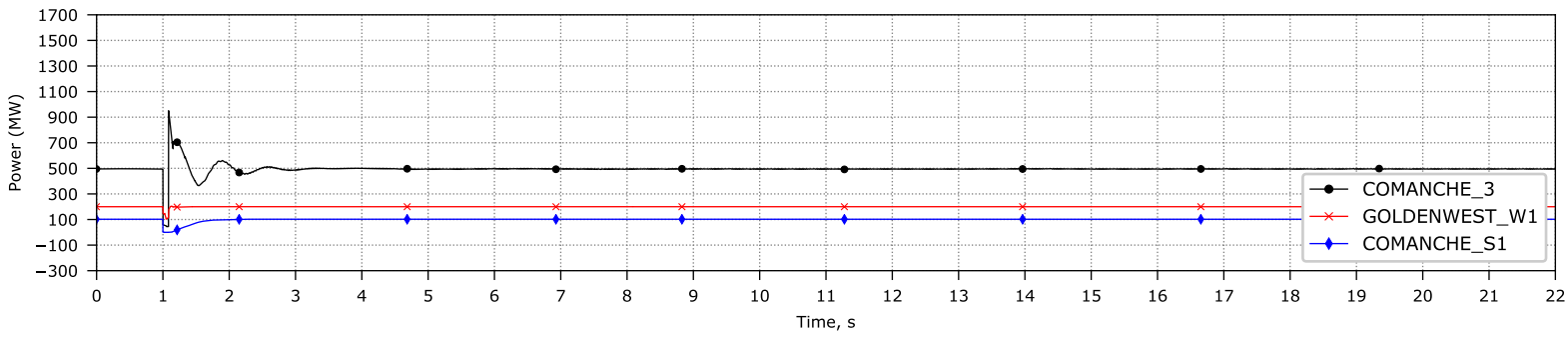


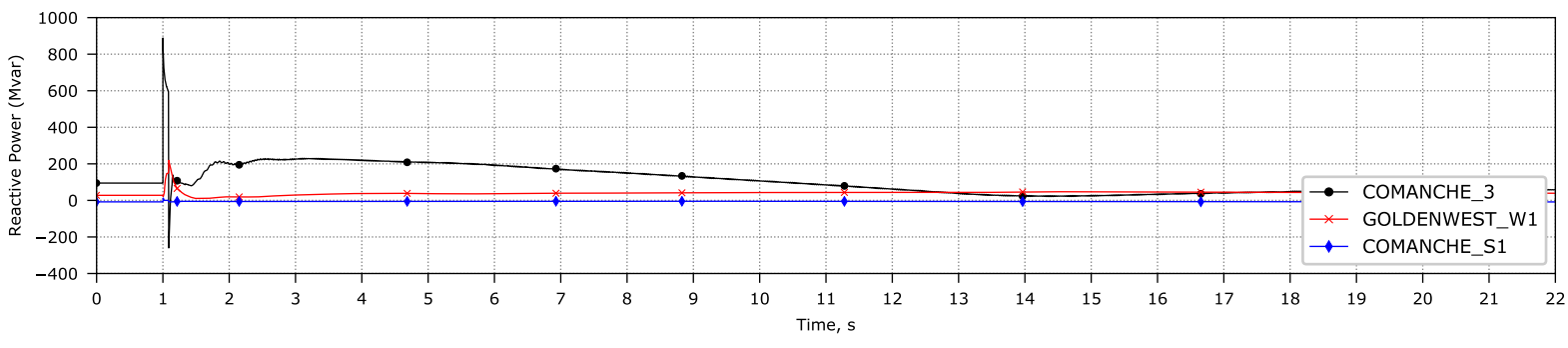


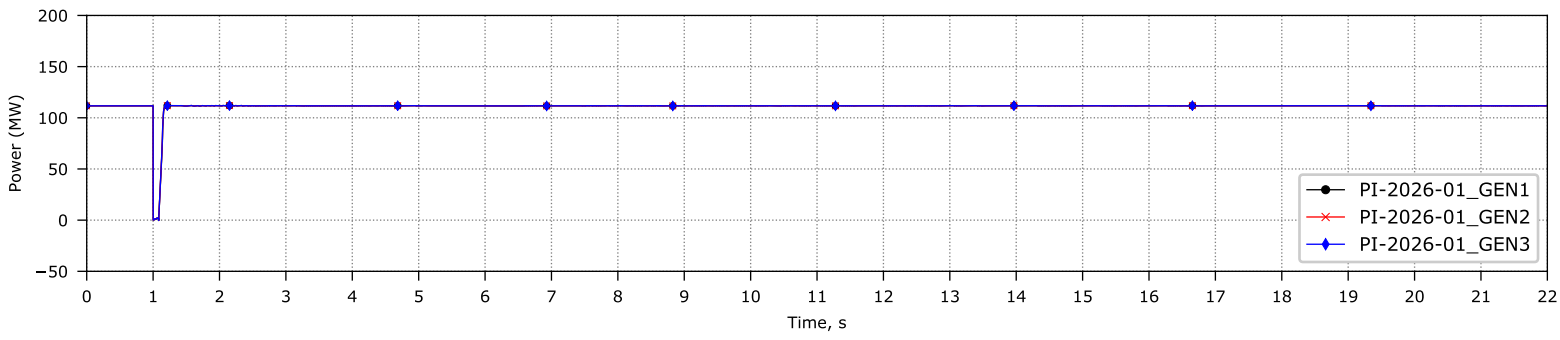


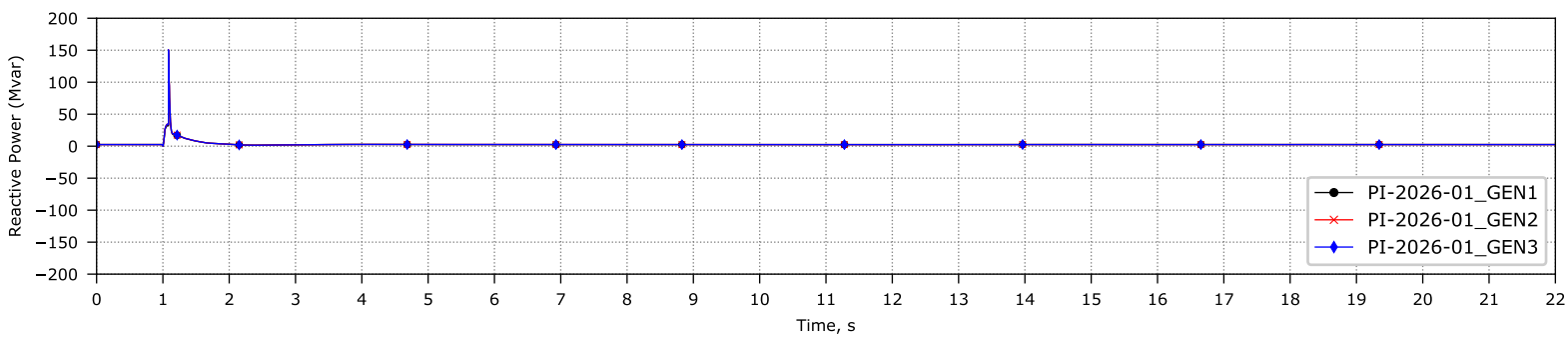
Comanche-HUCK-1_230kV

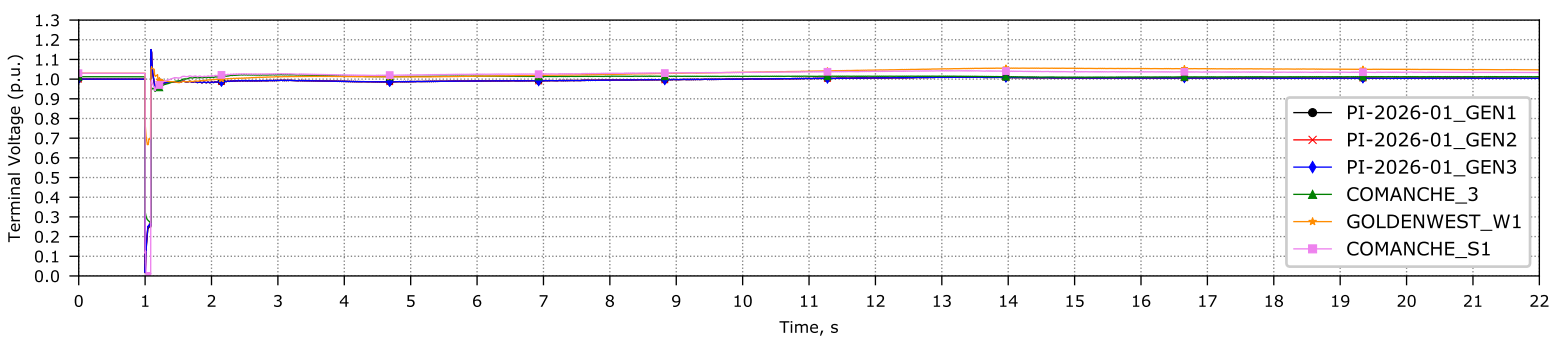


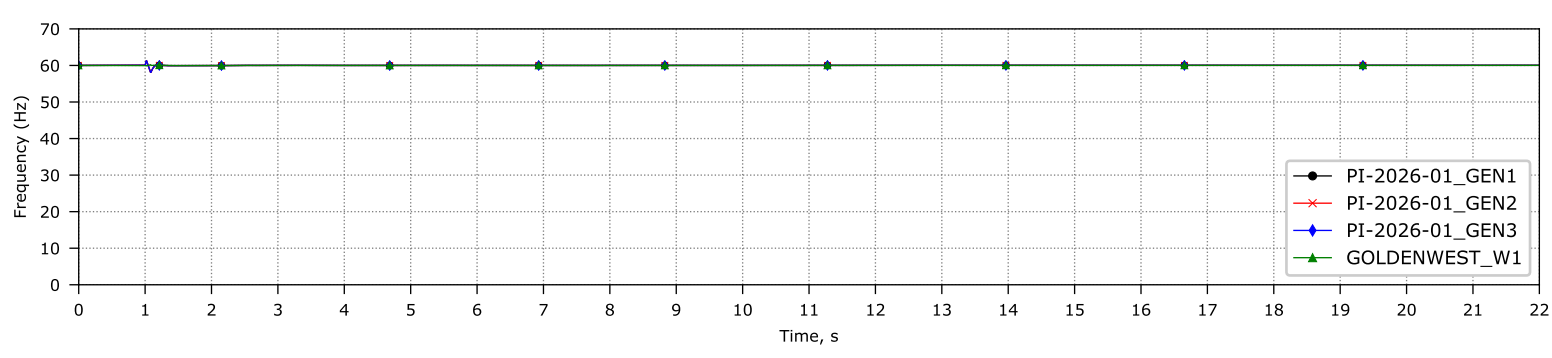


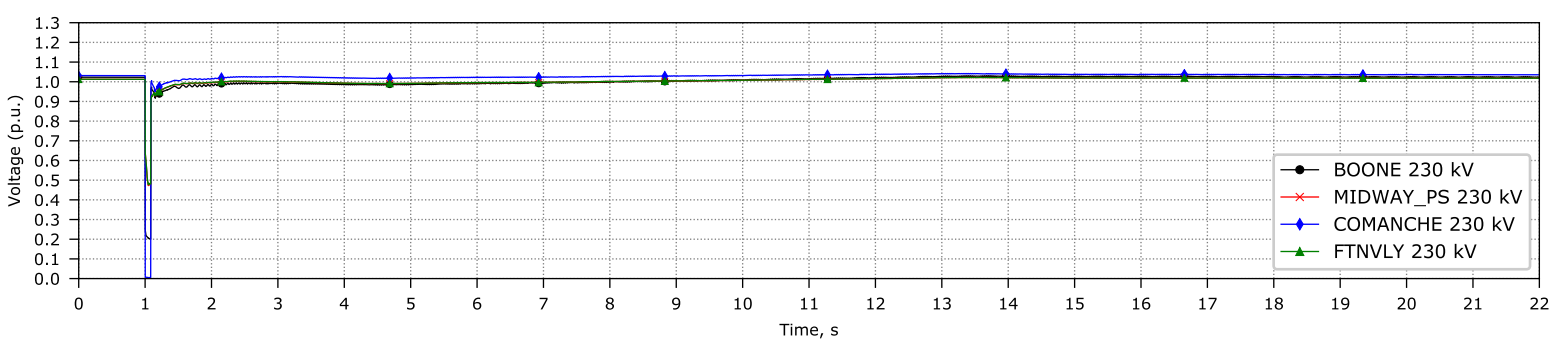


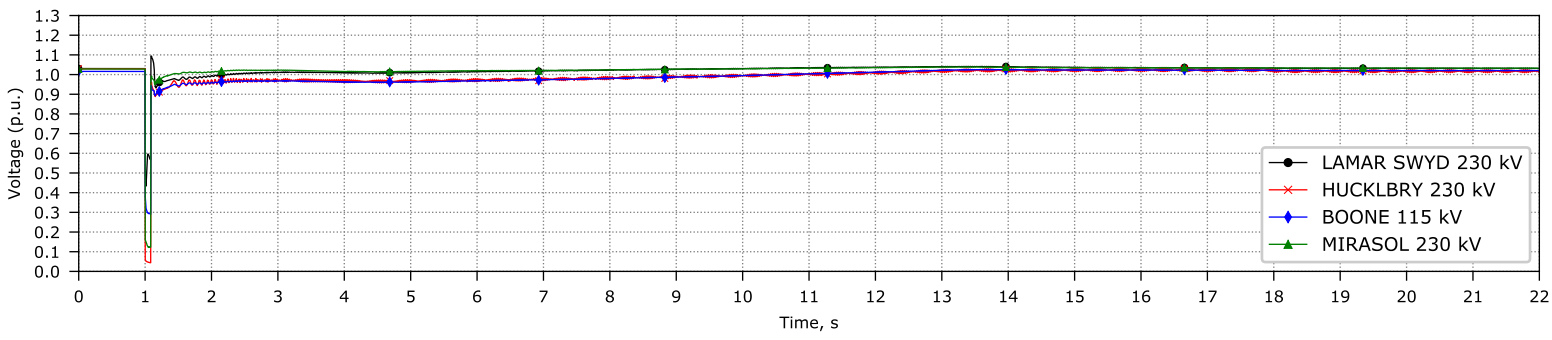




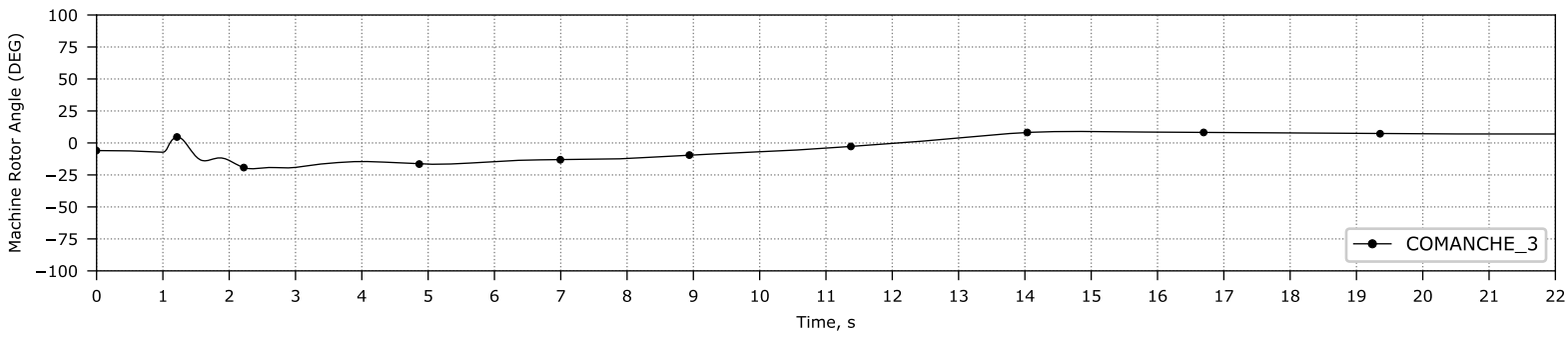


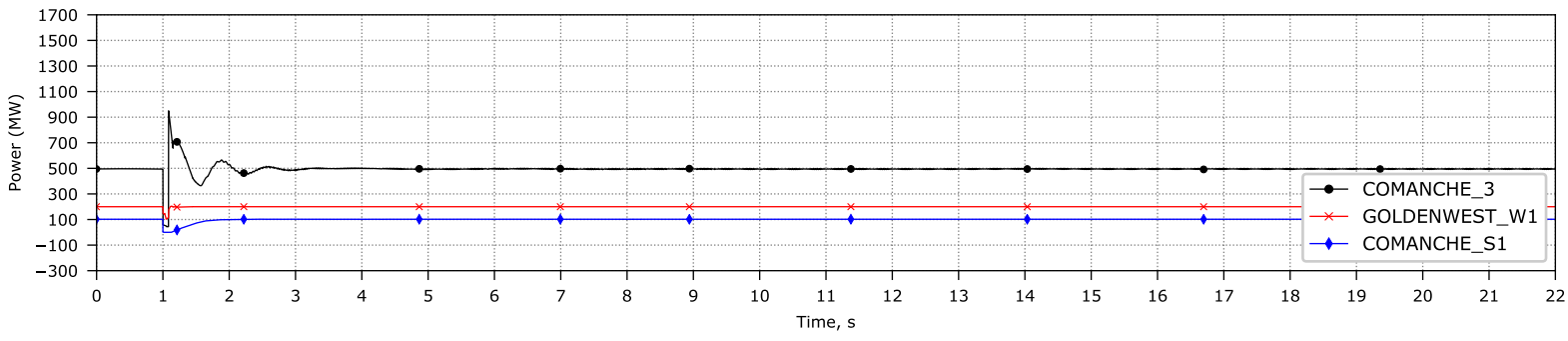


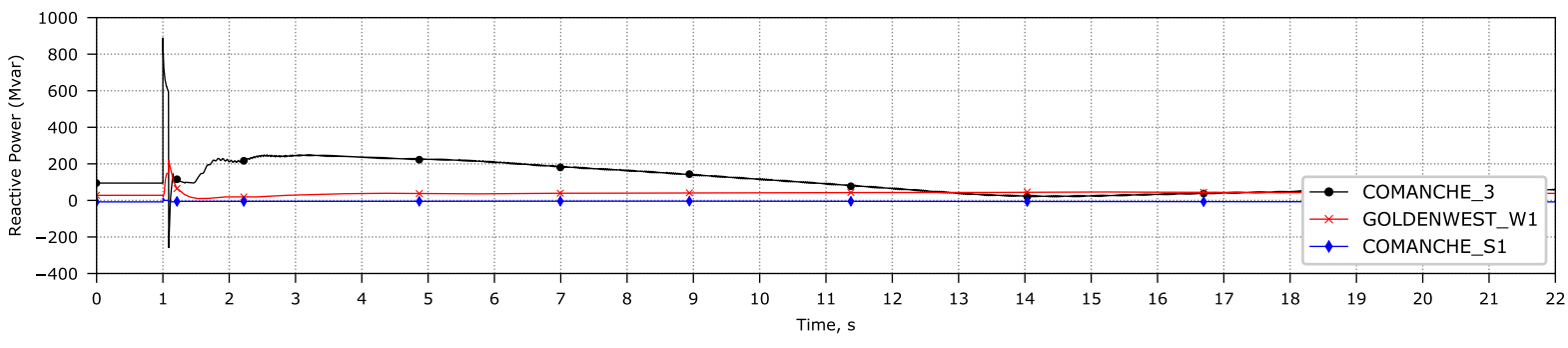


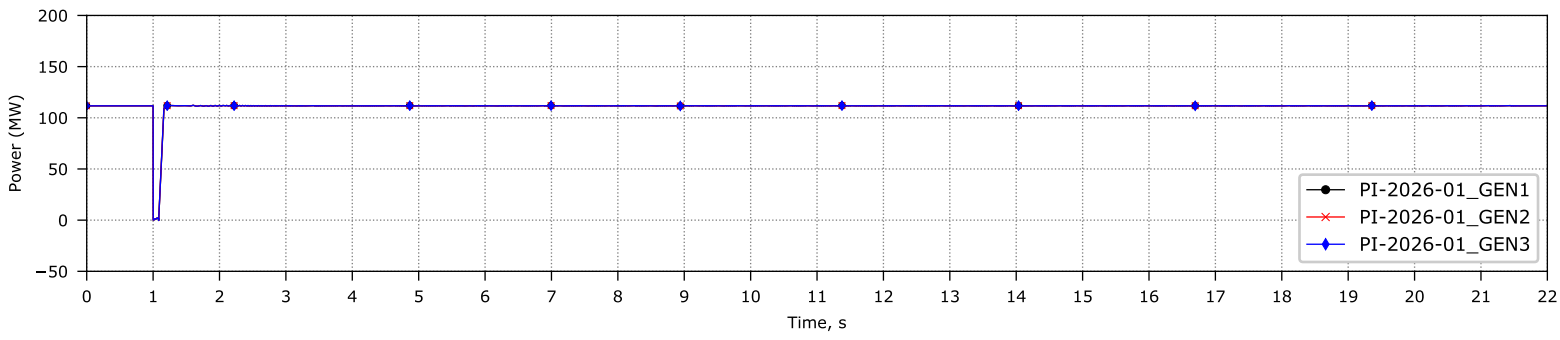


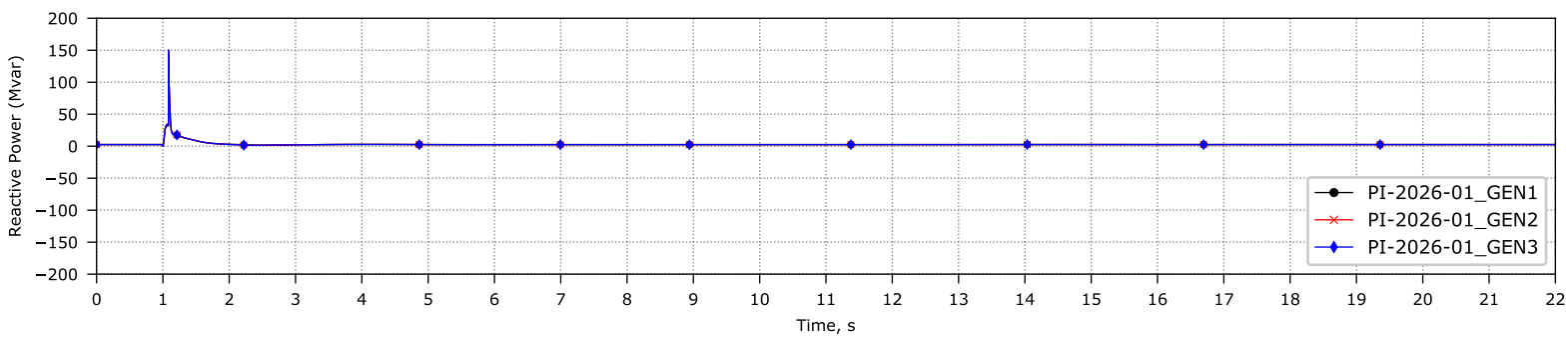
Comanche-GI_2020_10-1_230kV

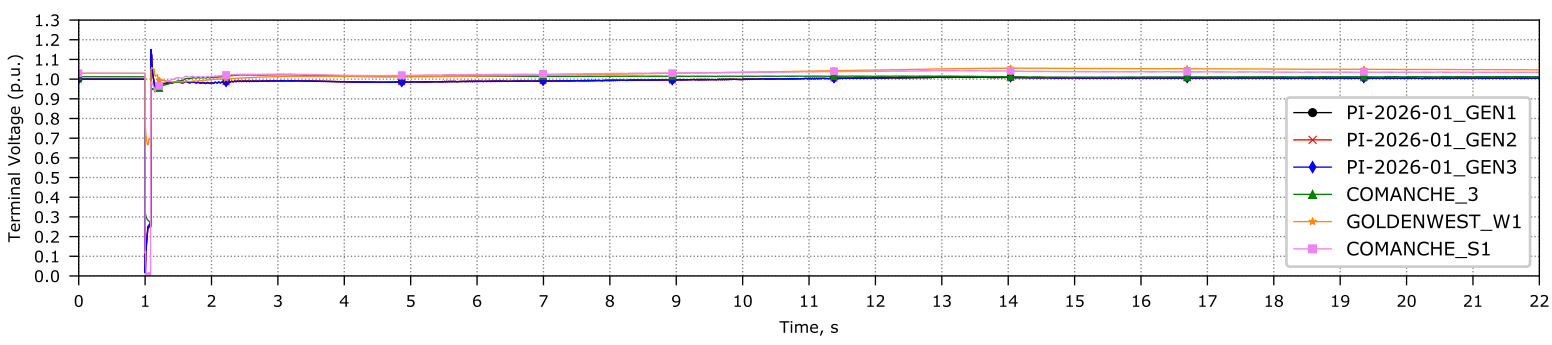


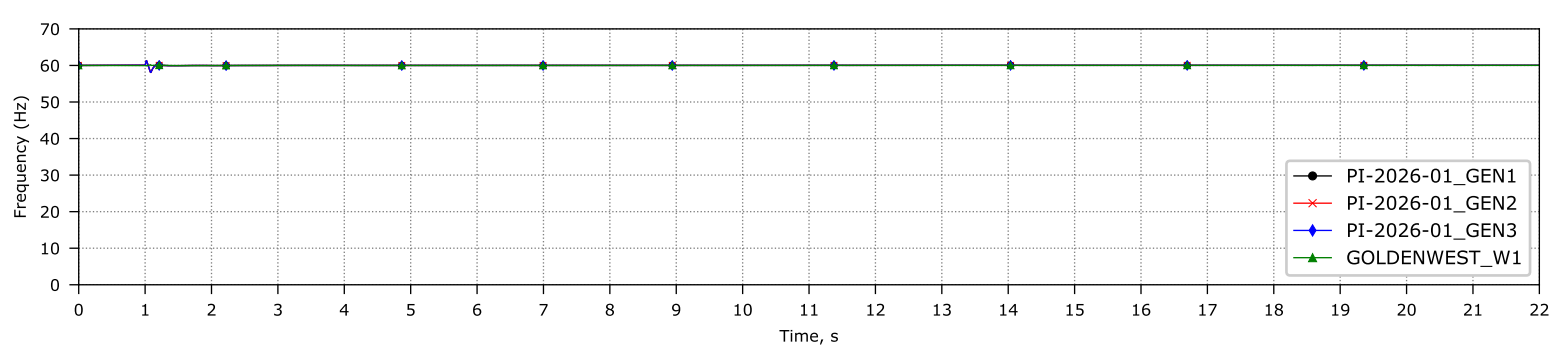


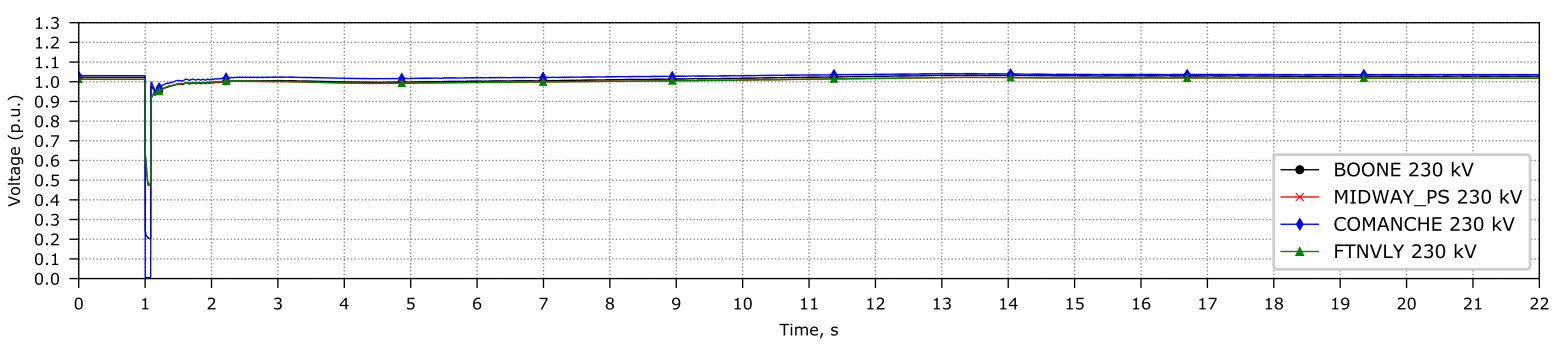


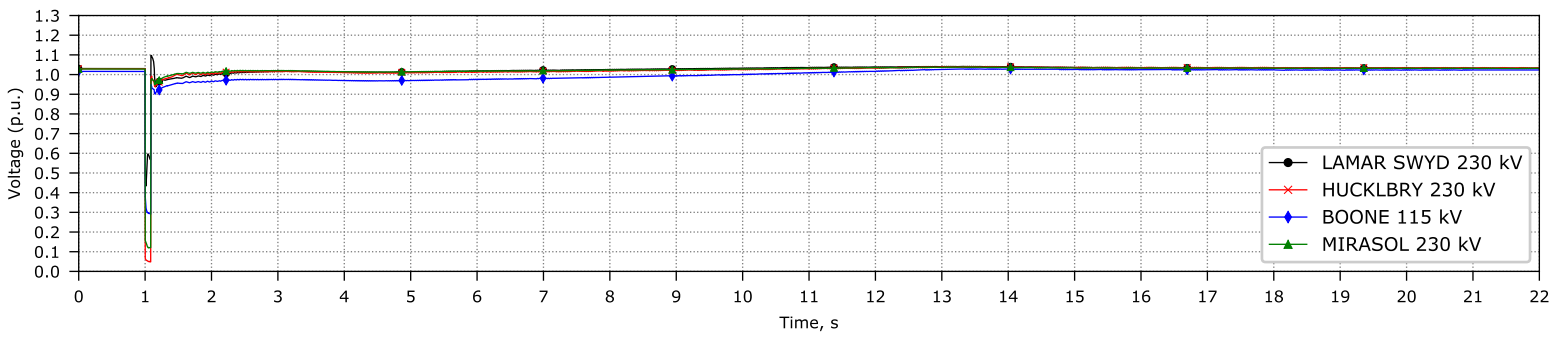




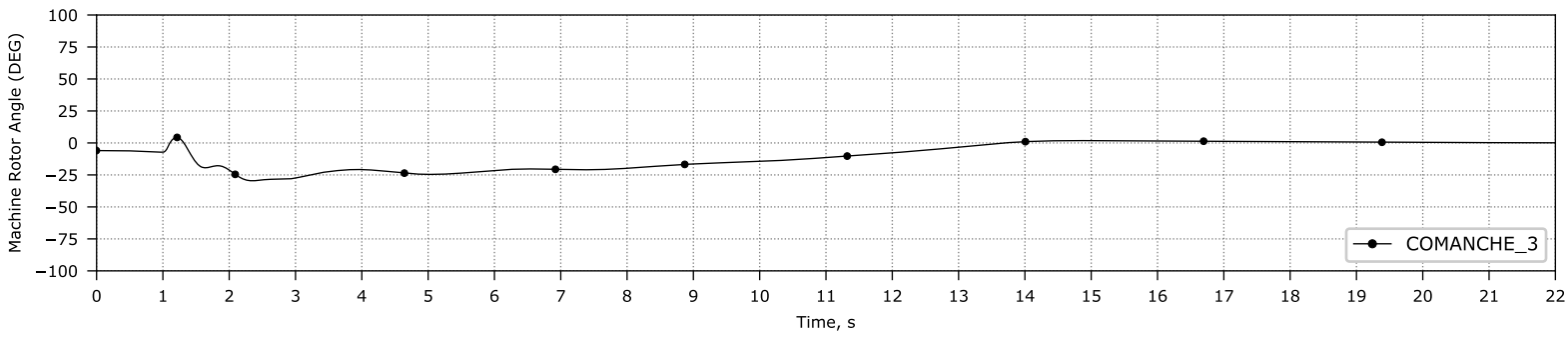


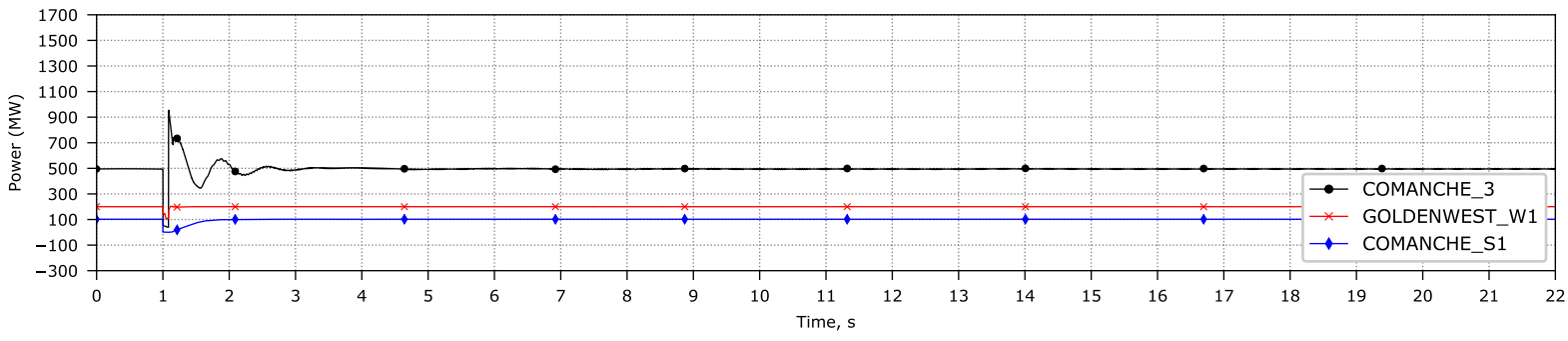


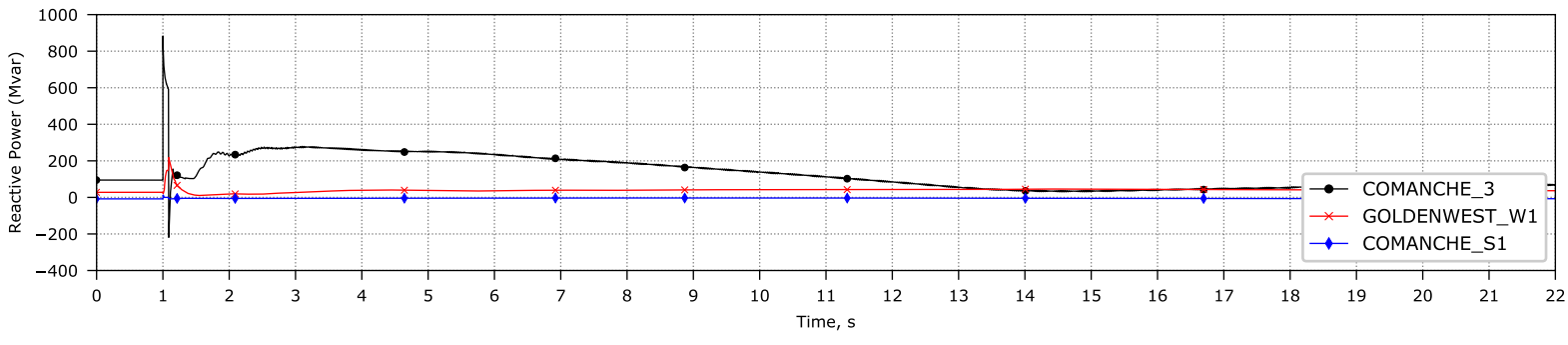


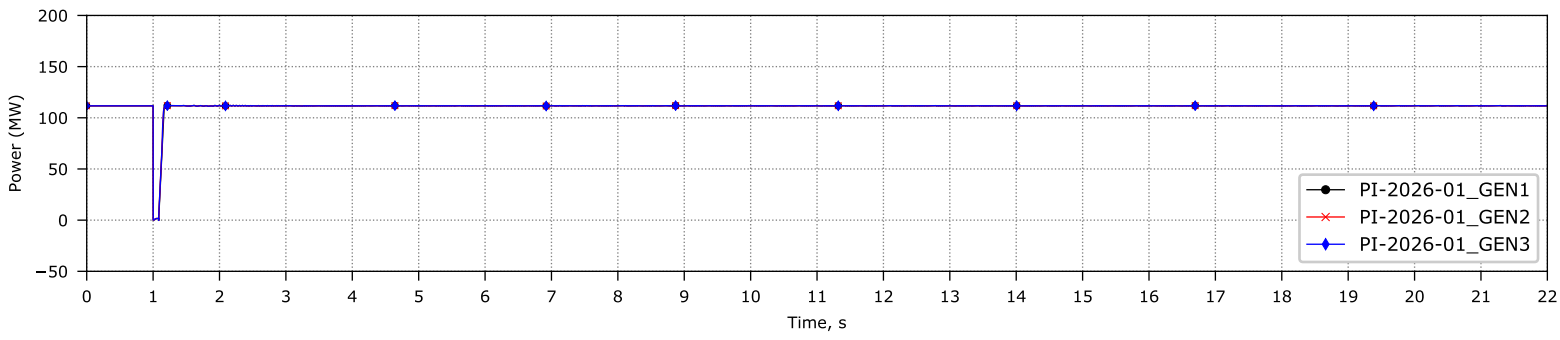


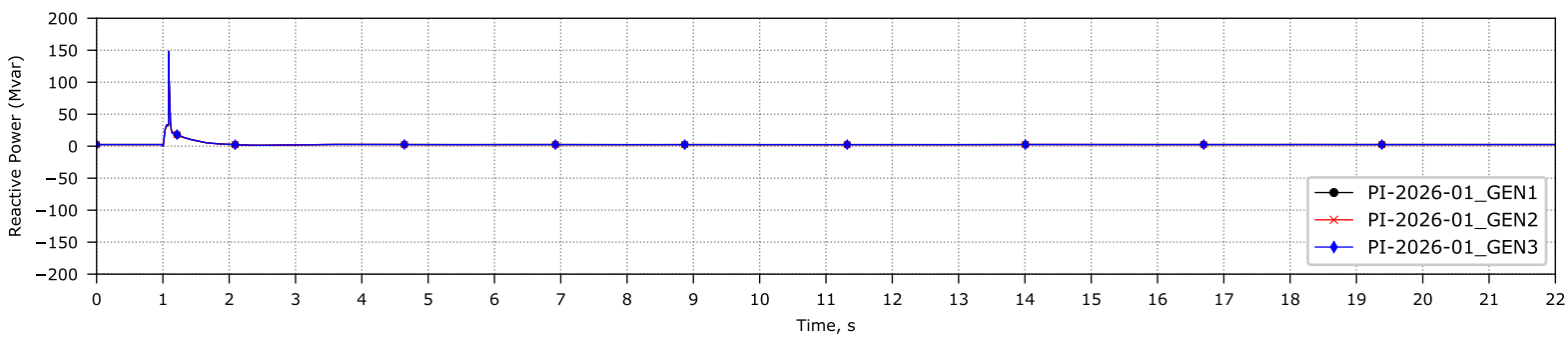
Comanche-SUNM-1_230kV

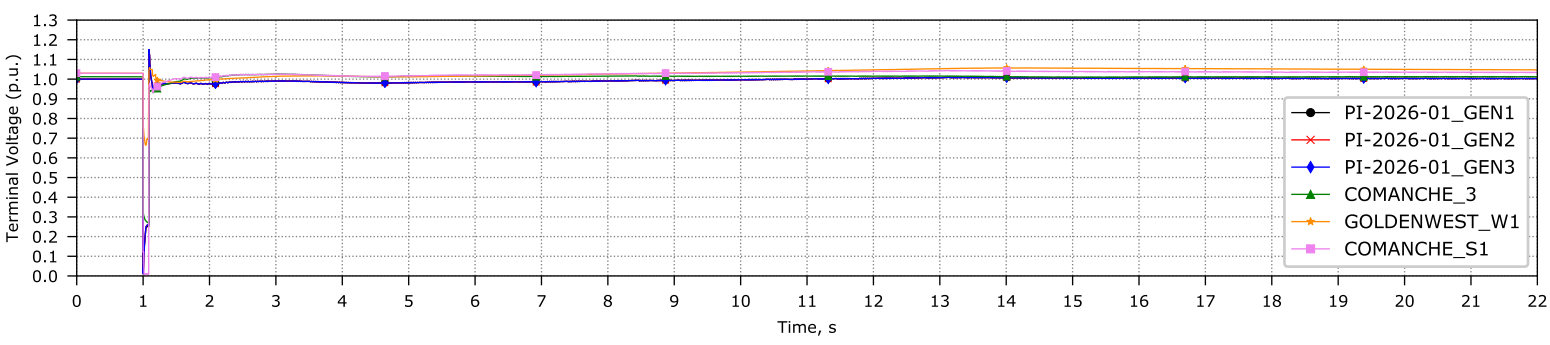


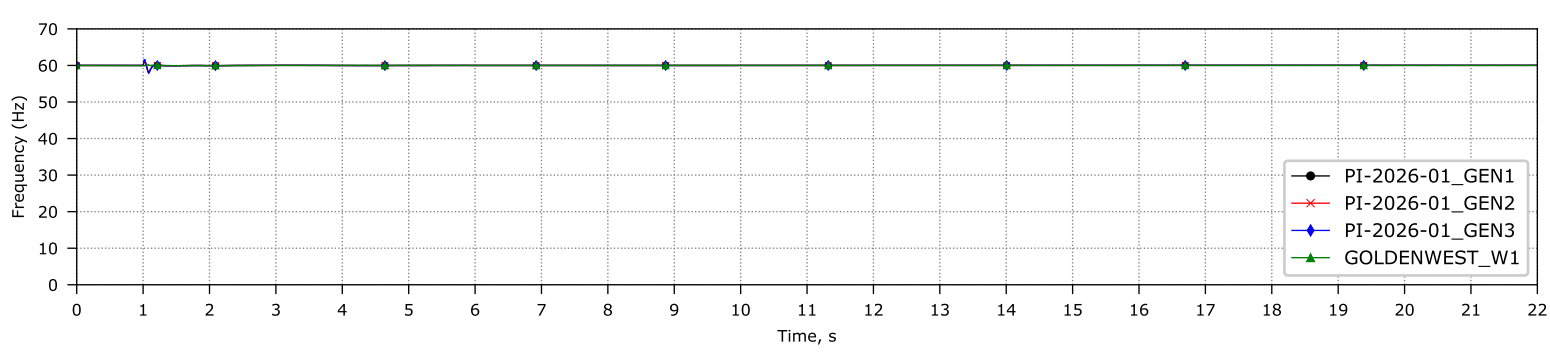


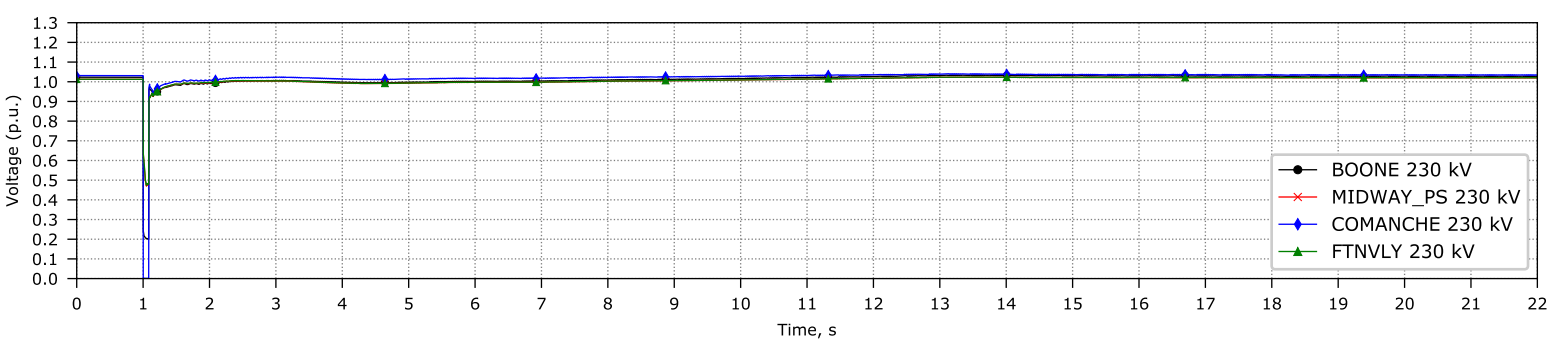


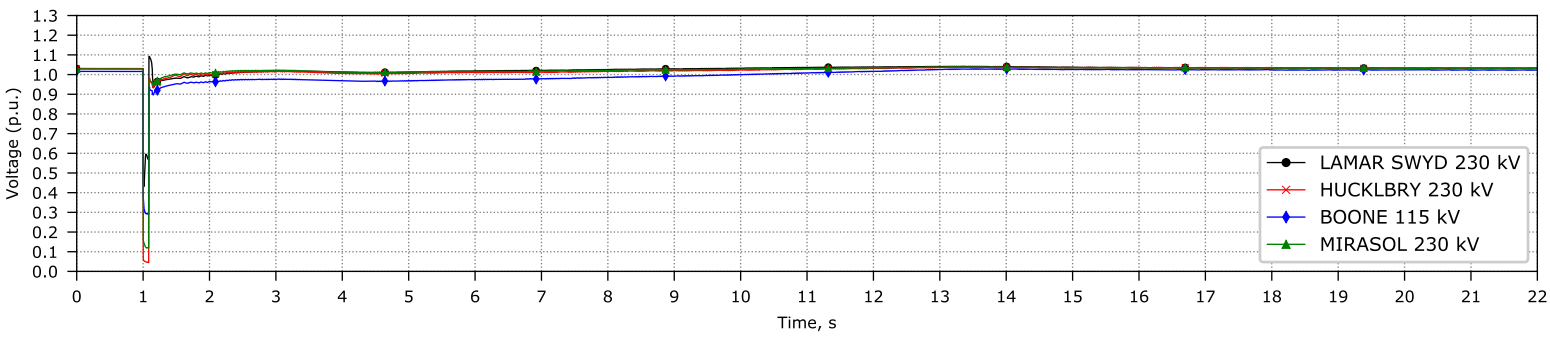




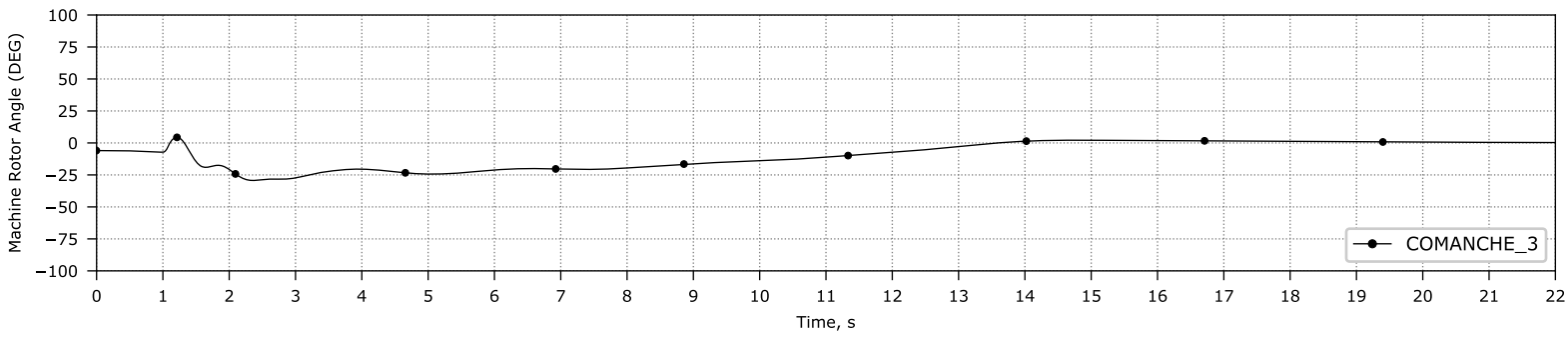


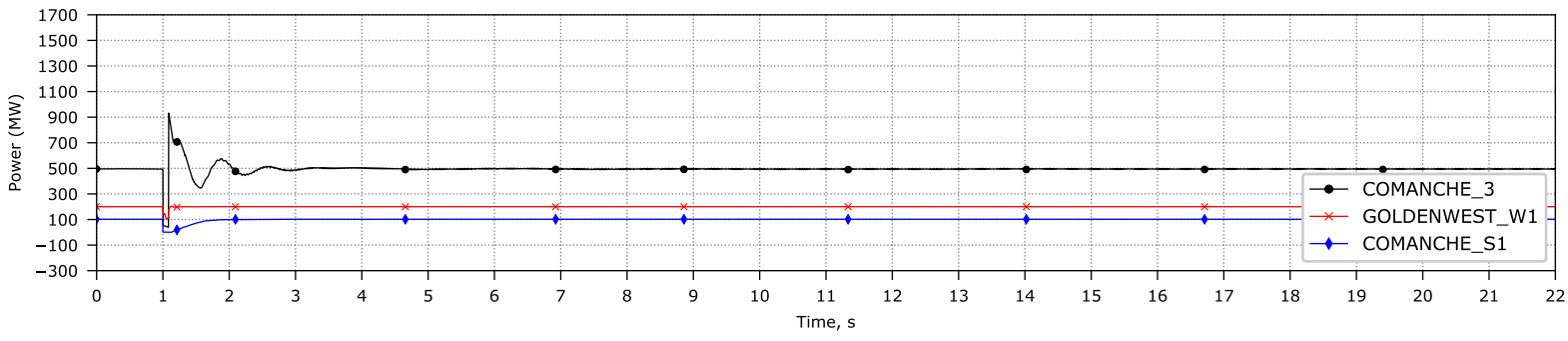


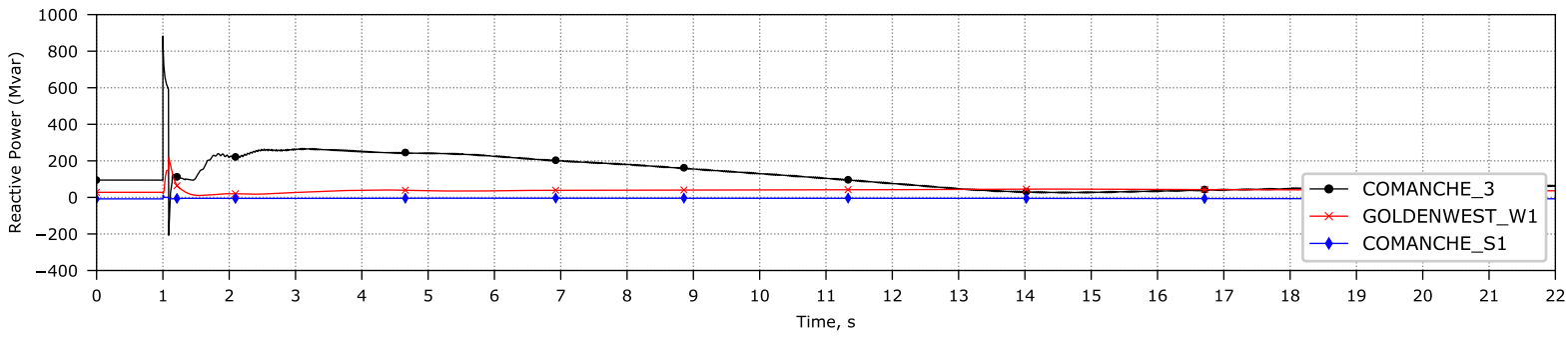


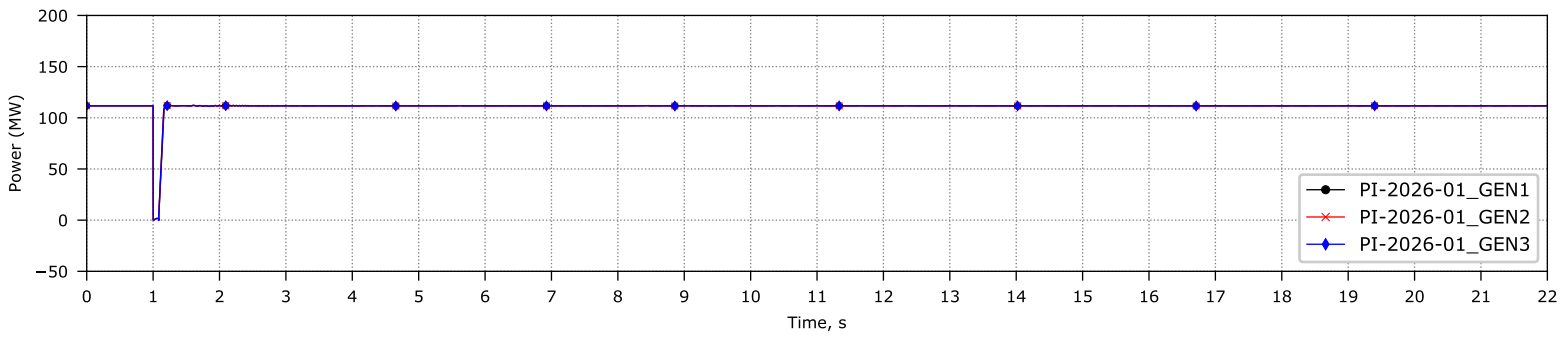


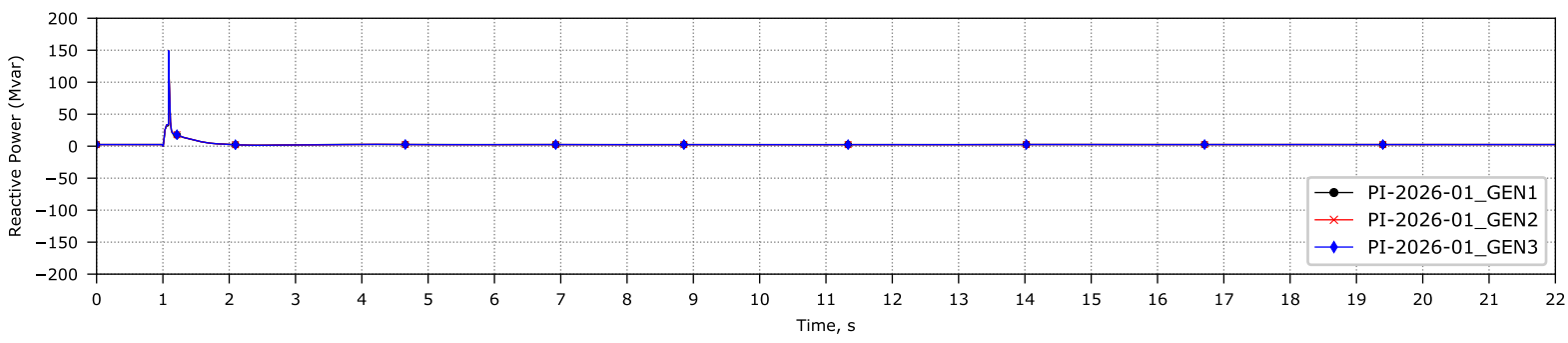
BIGH-Comanche-1_230kV

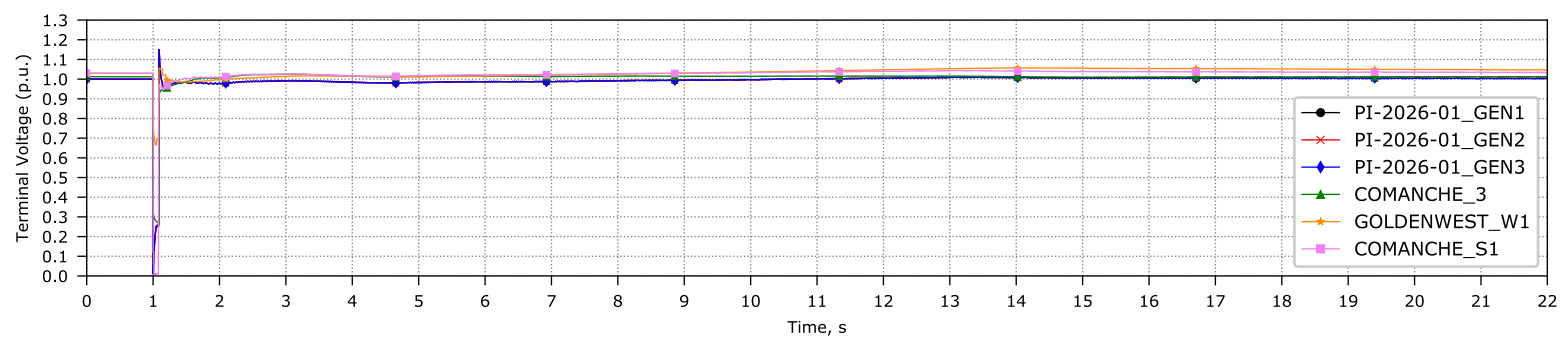


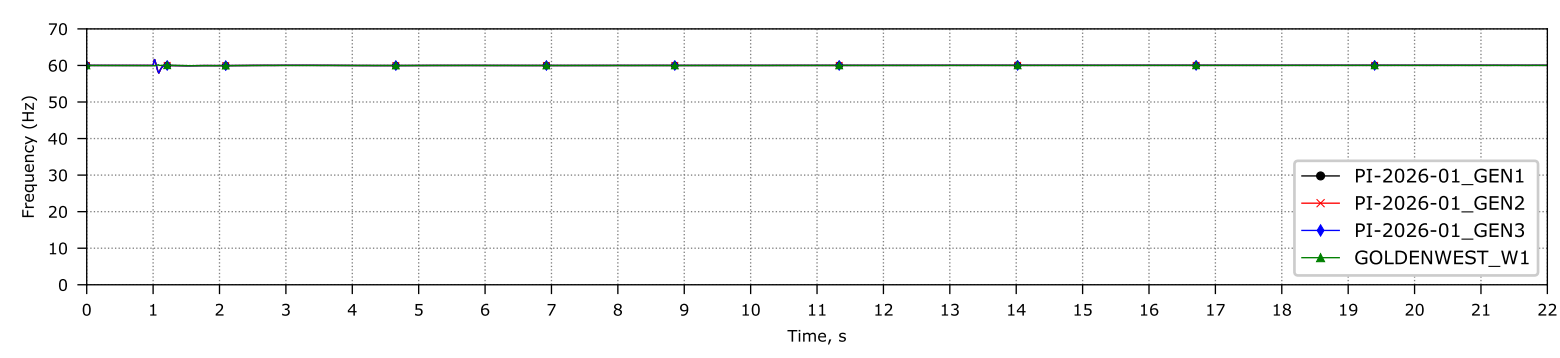


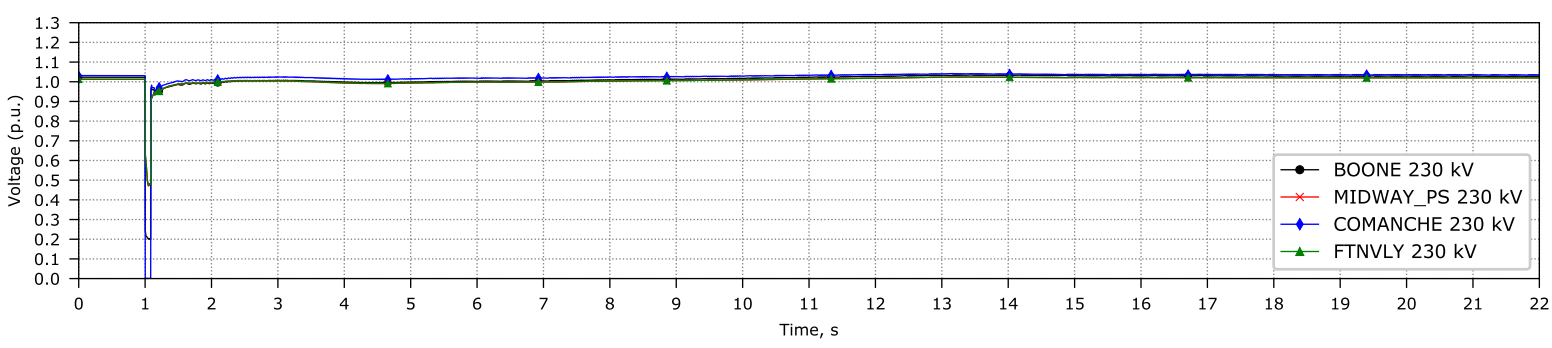


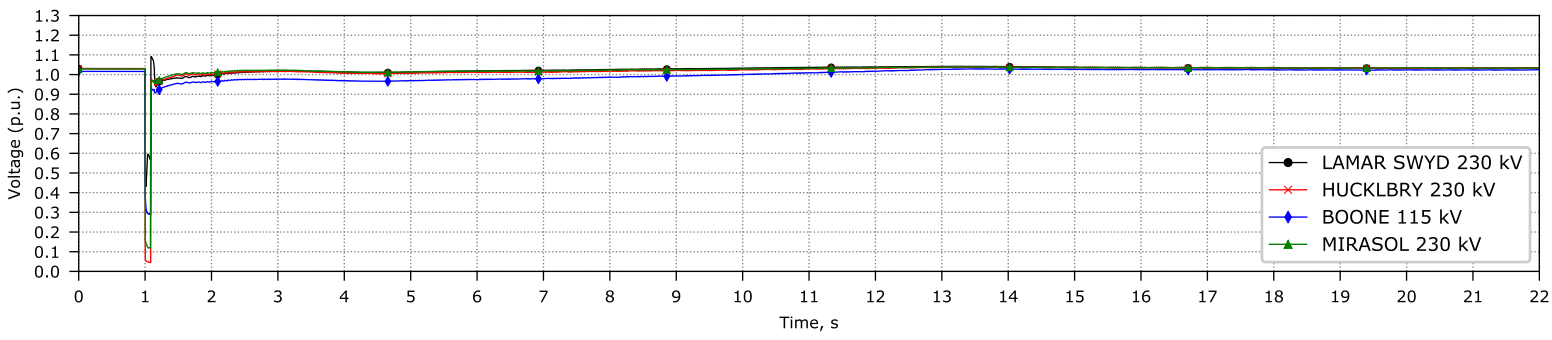




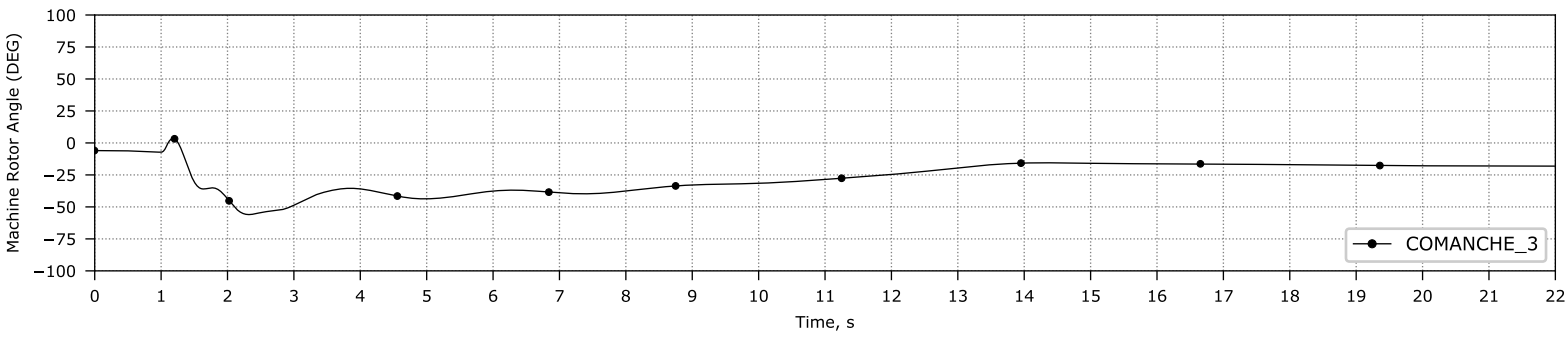


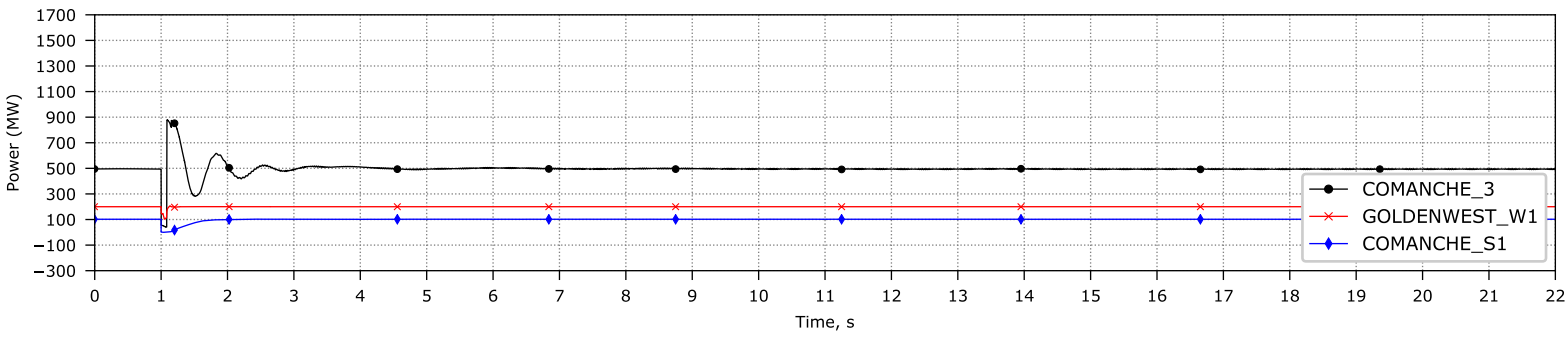


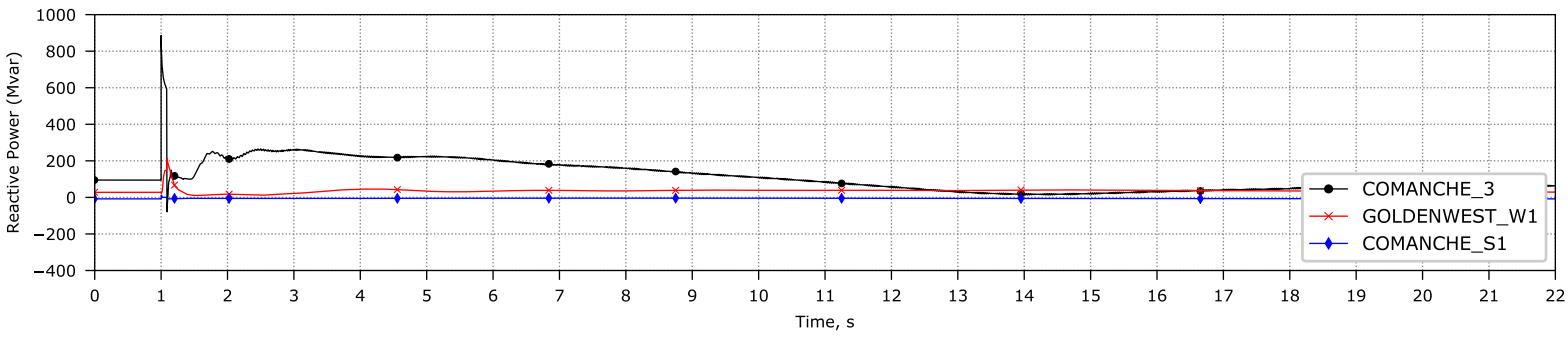


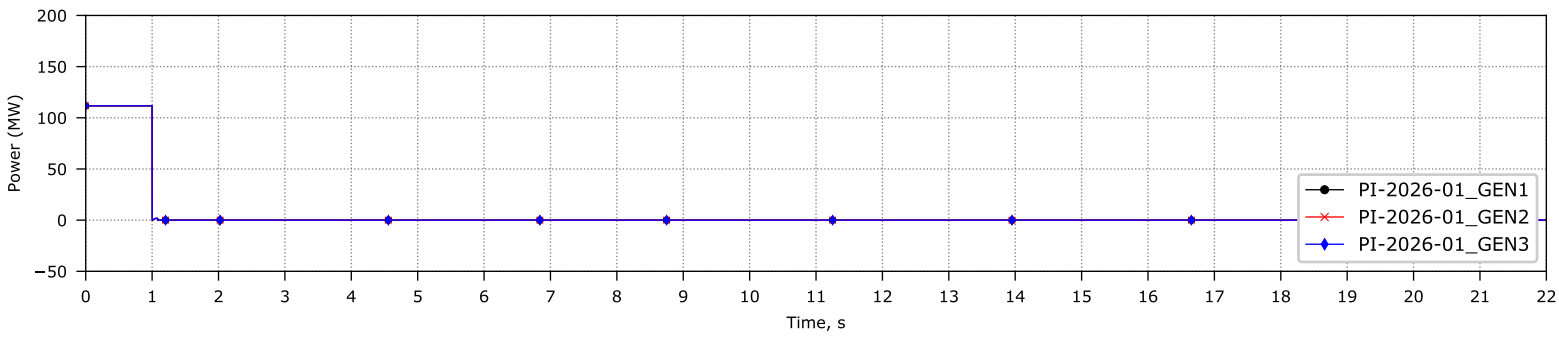


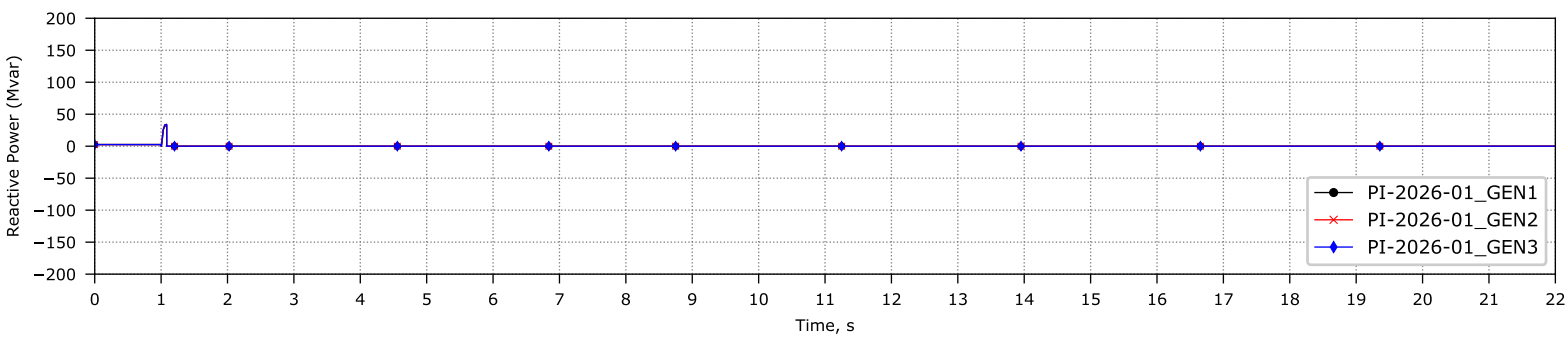
REPL_2024-Comanche-1_230kV

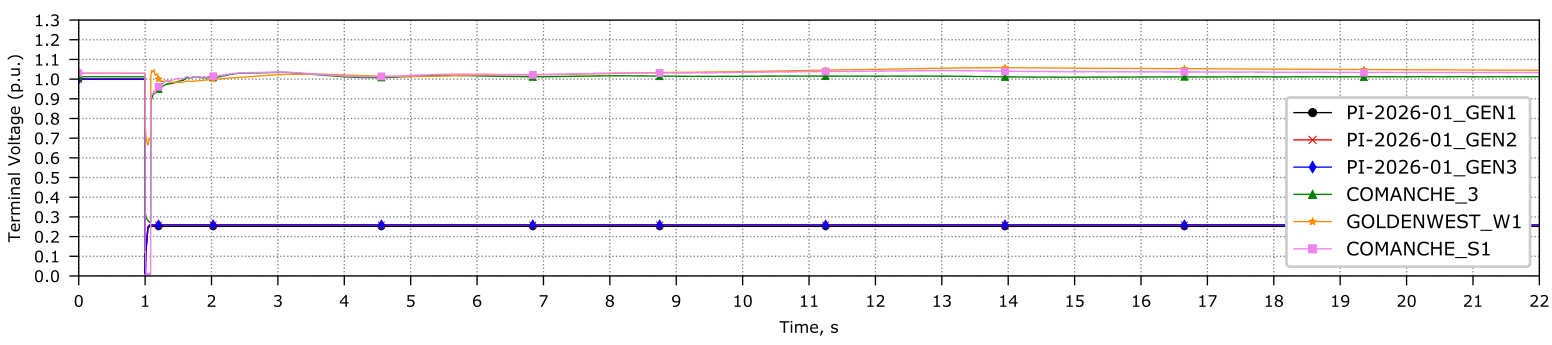


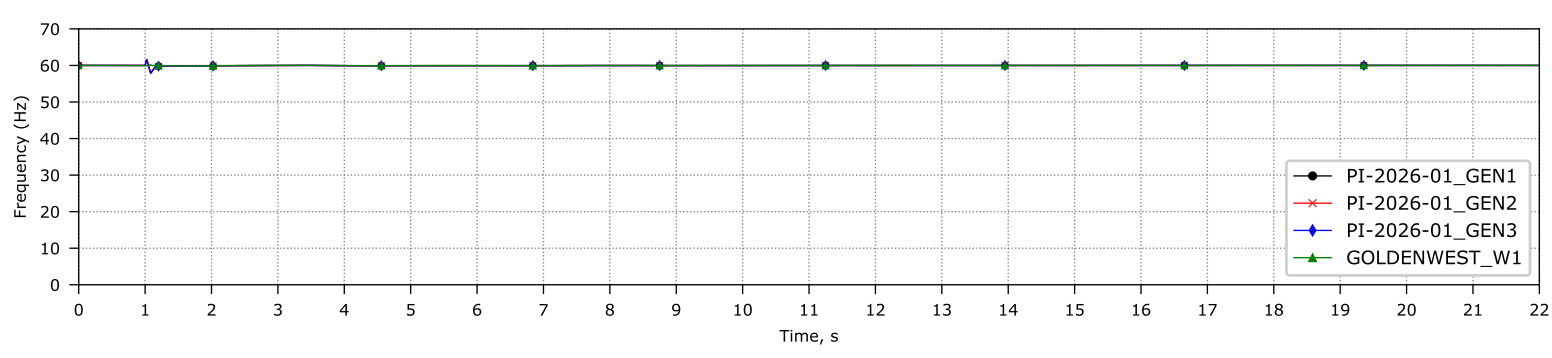


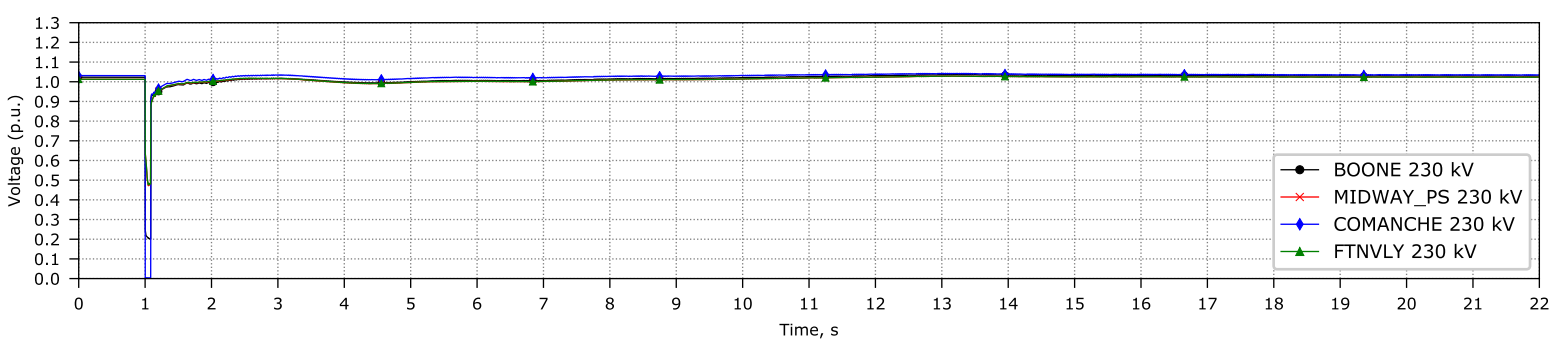


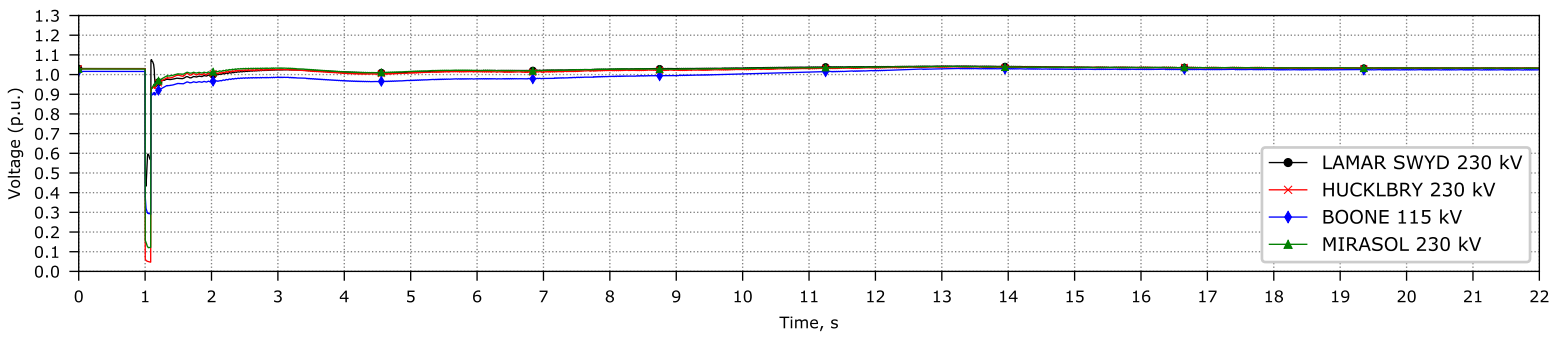




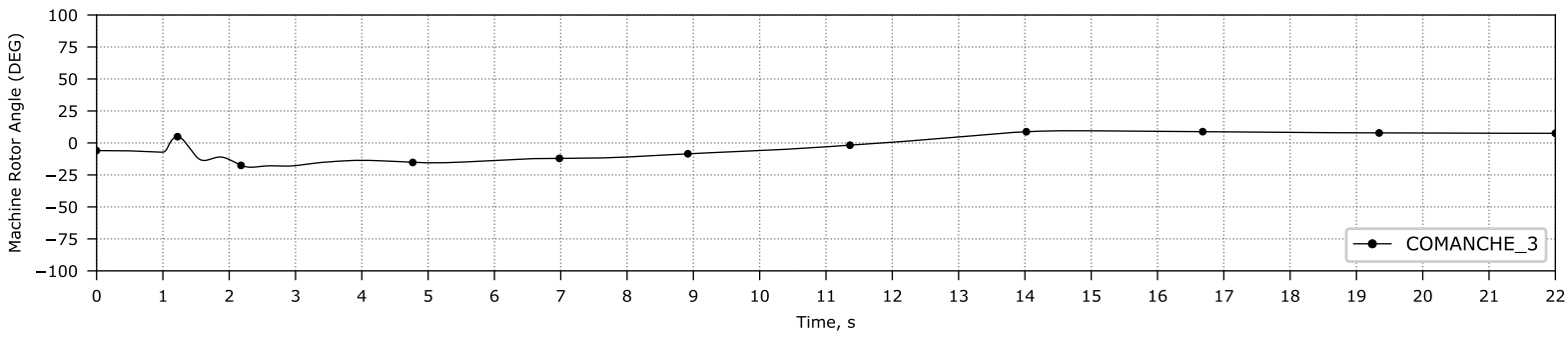


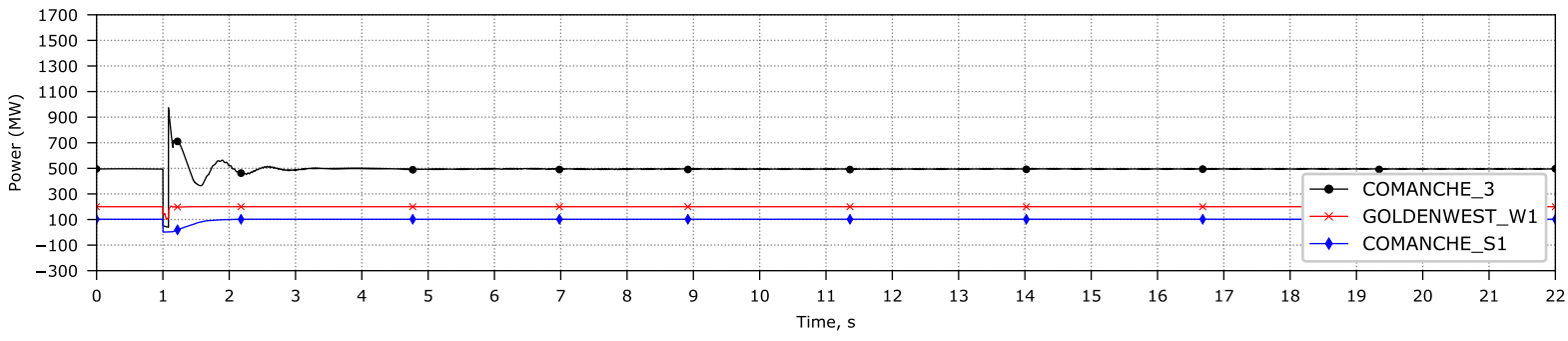


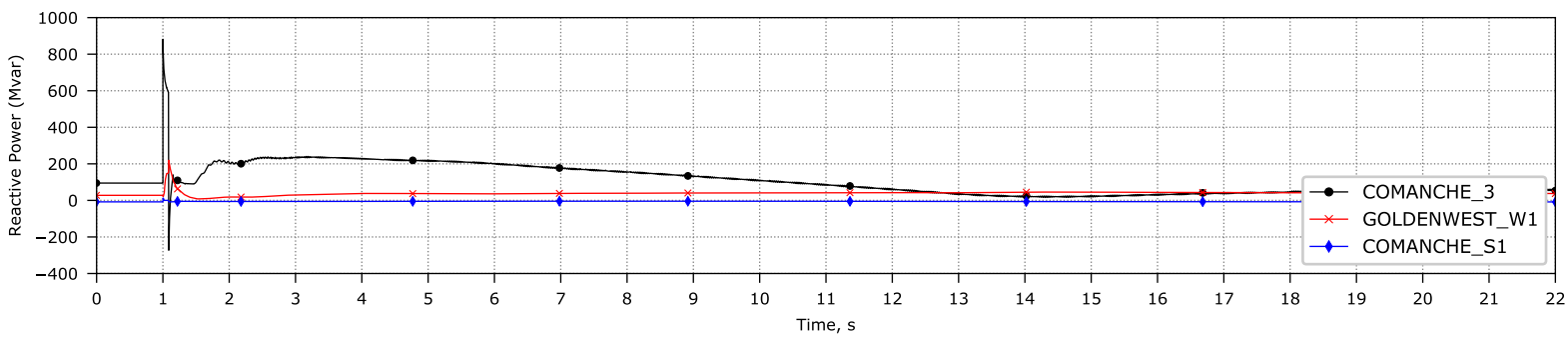


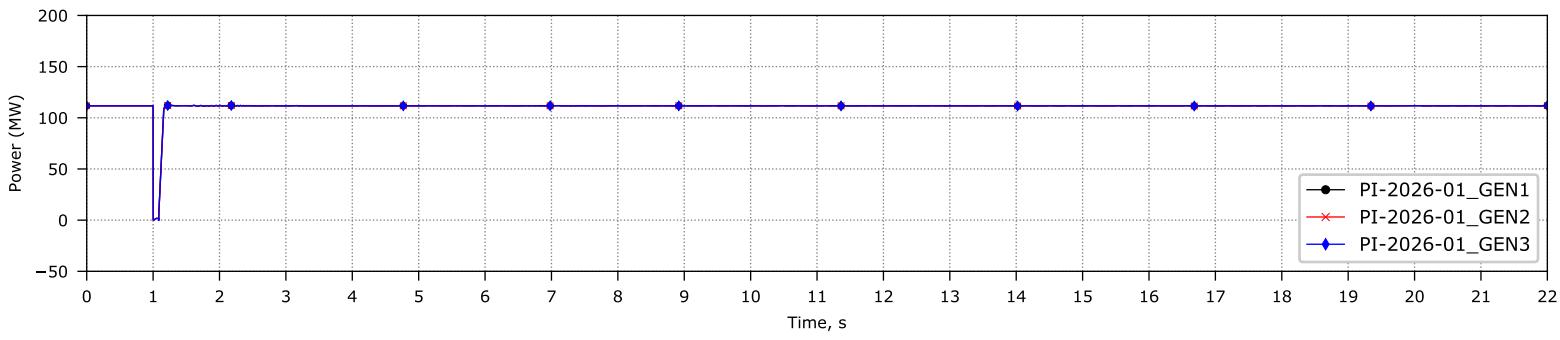


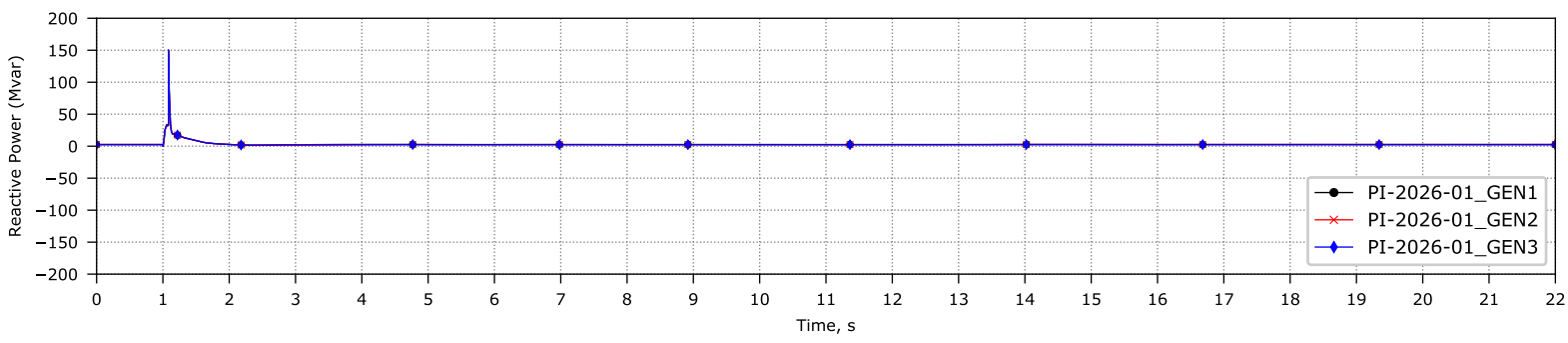
Coman U2

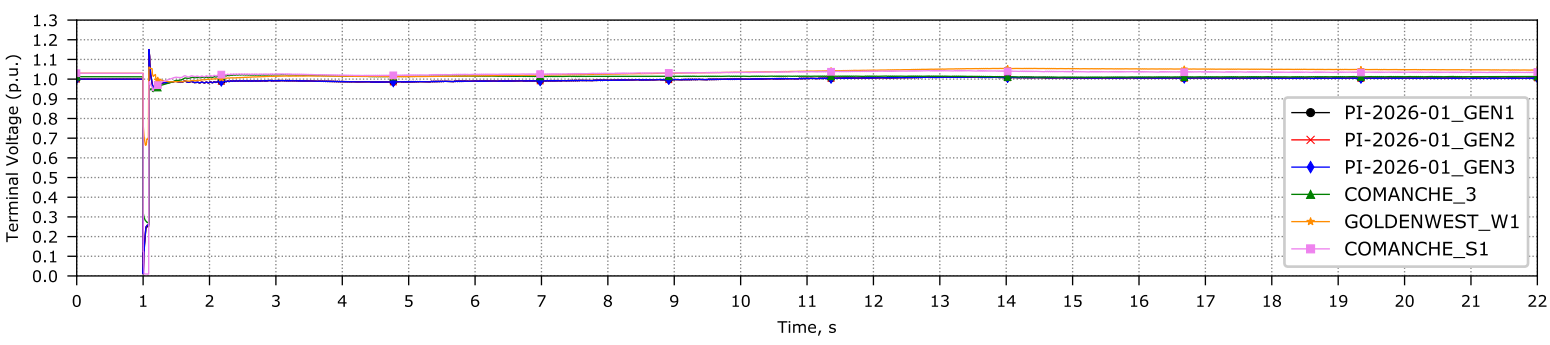

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

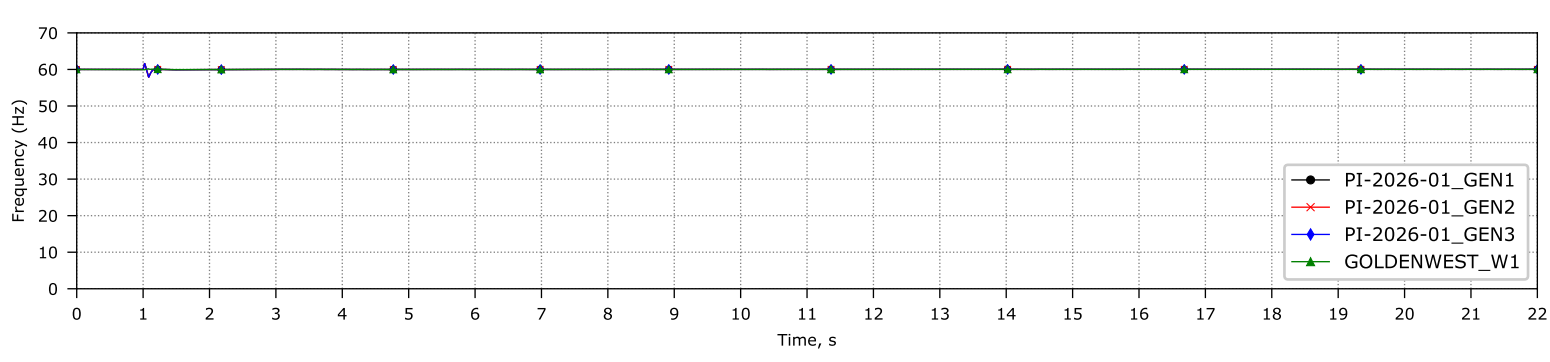

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

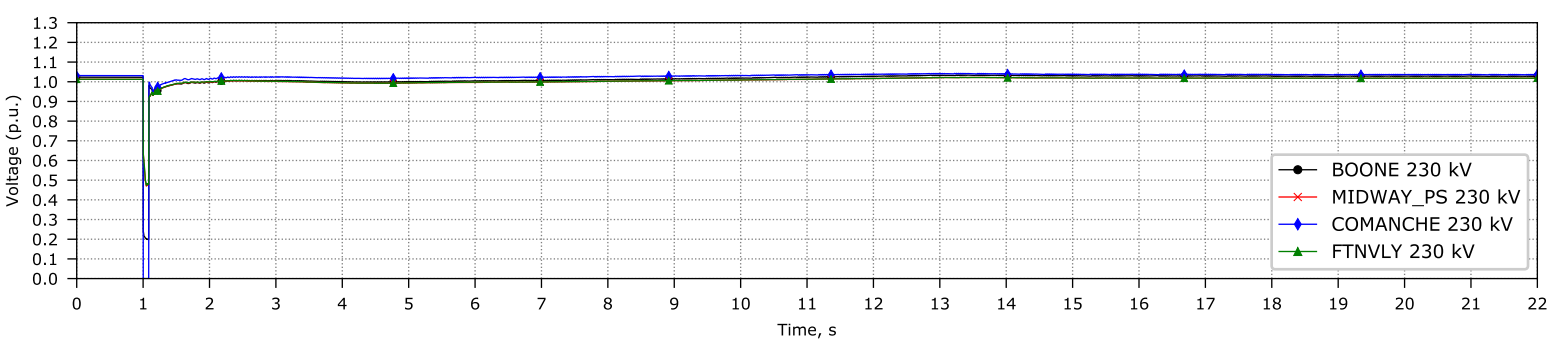

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

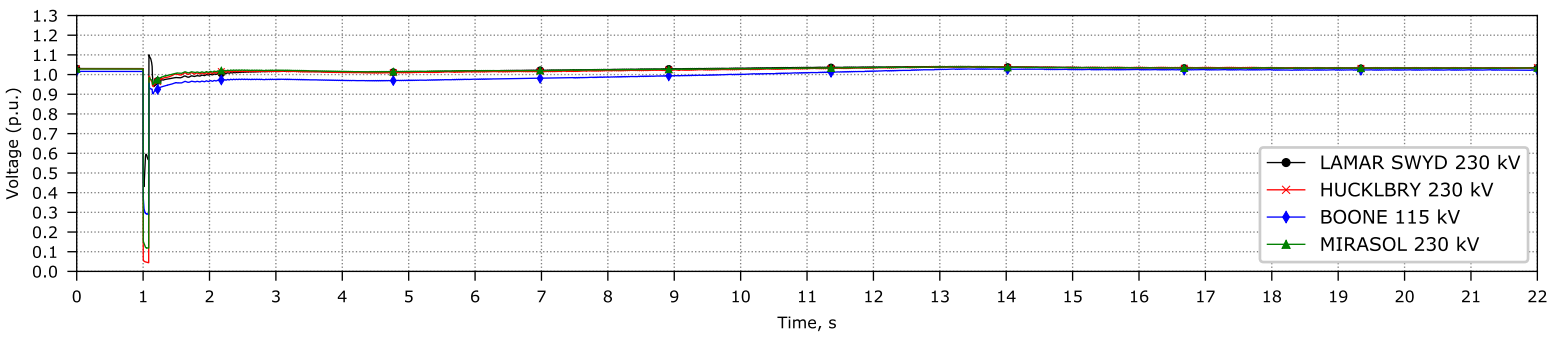

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

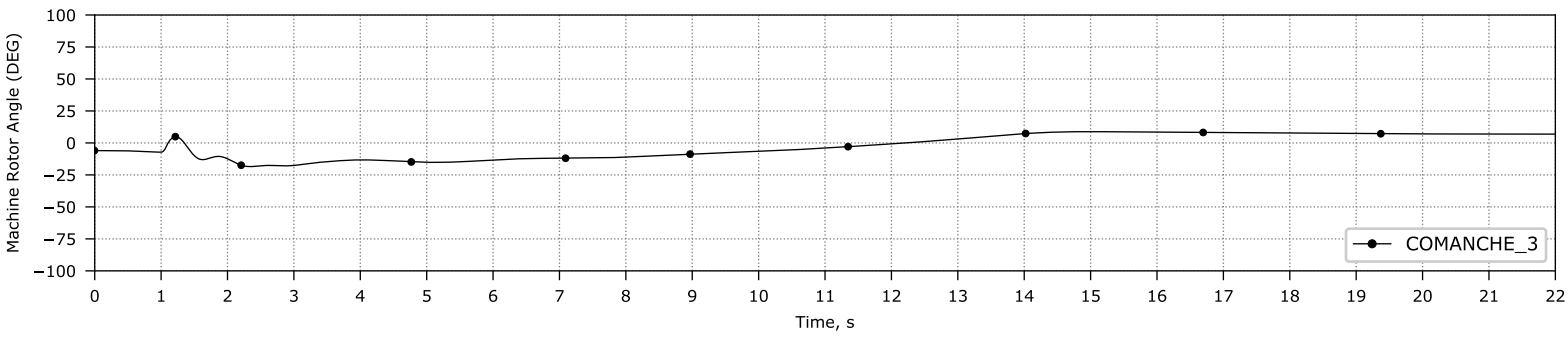

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

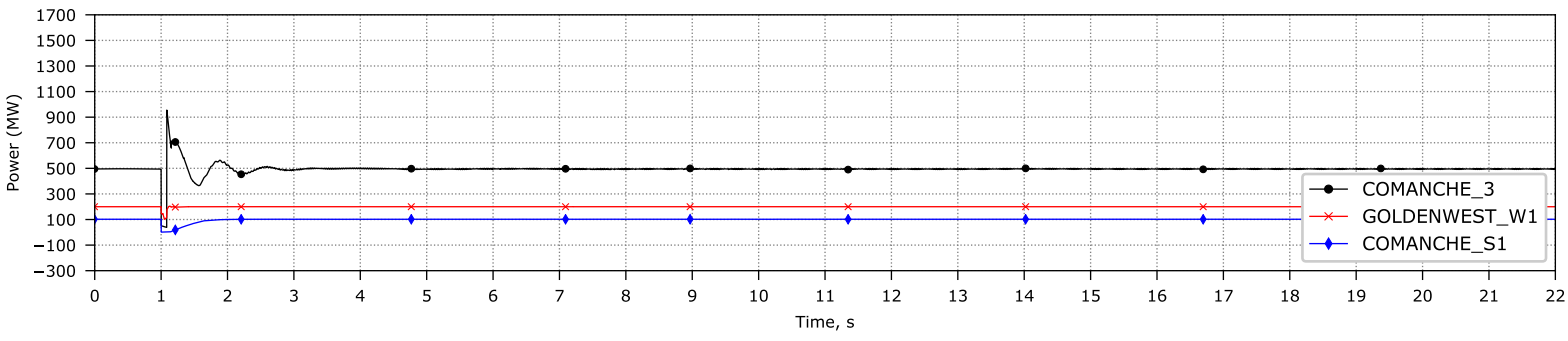

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

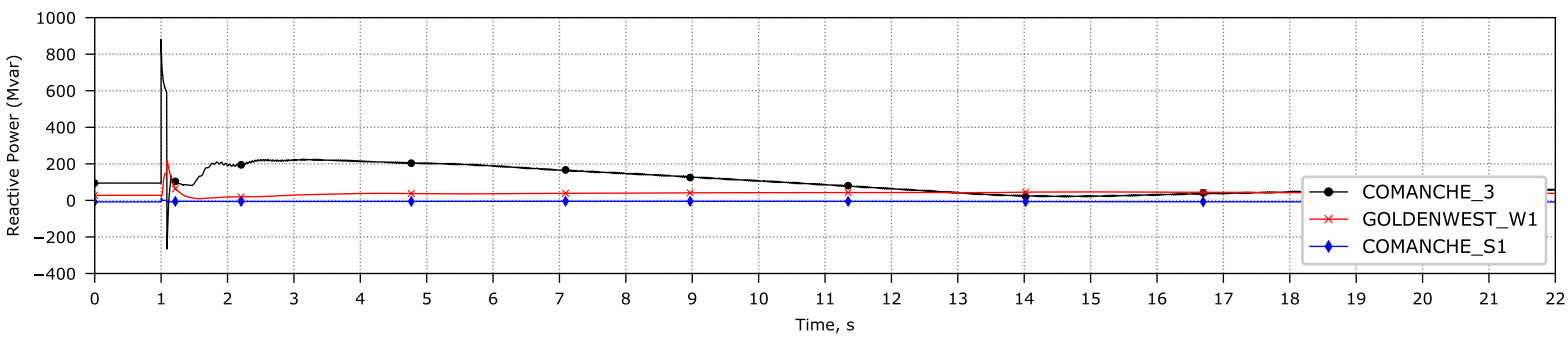

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

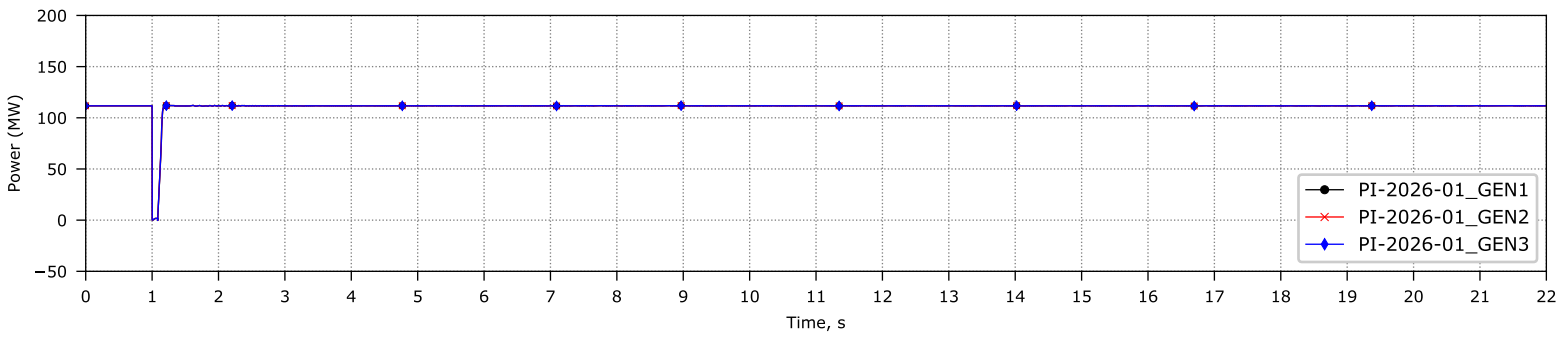

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

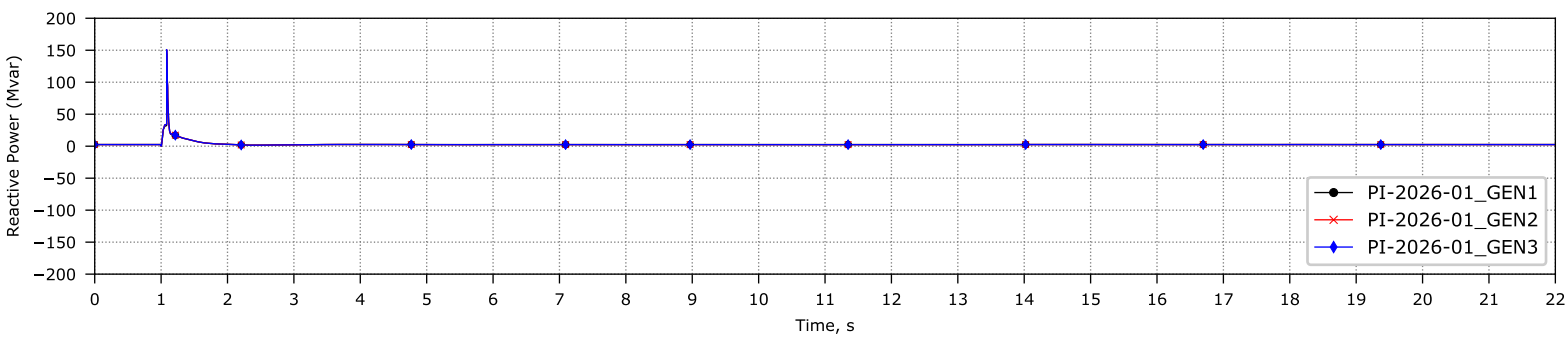
Coman T1

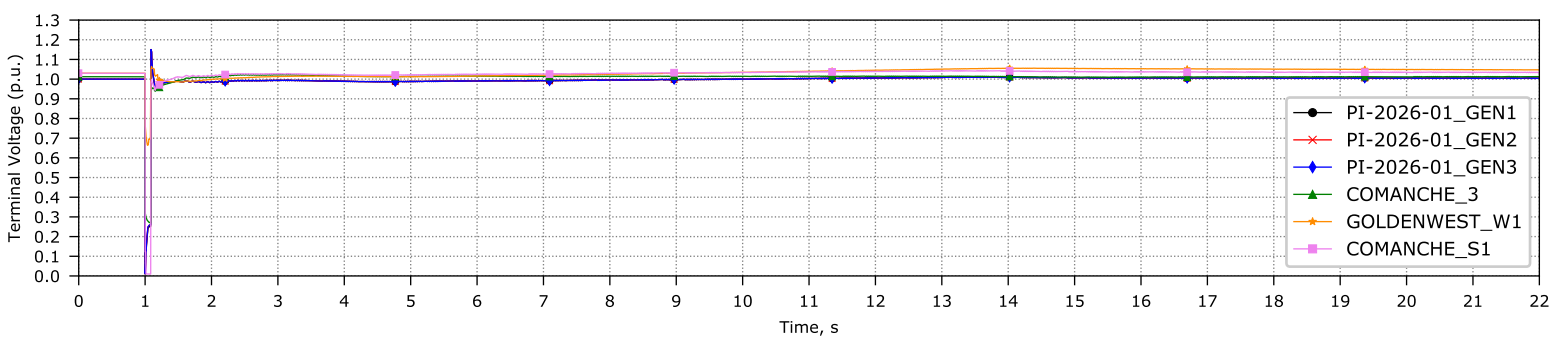

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

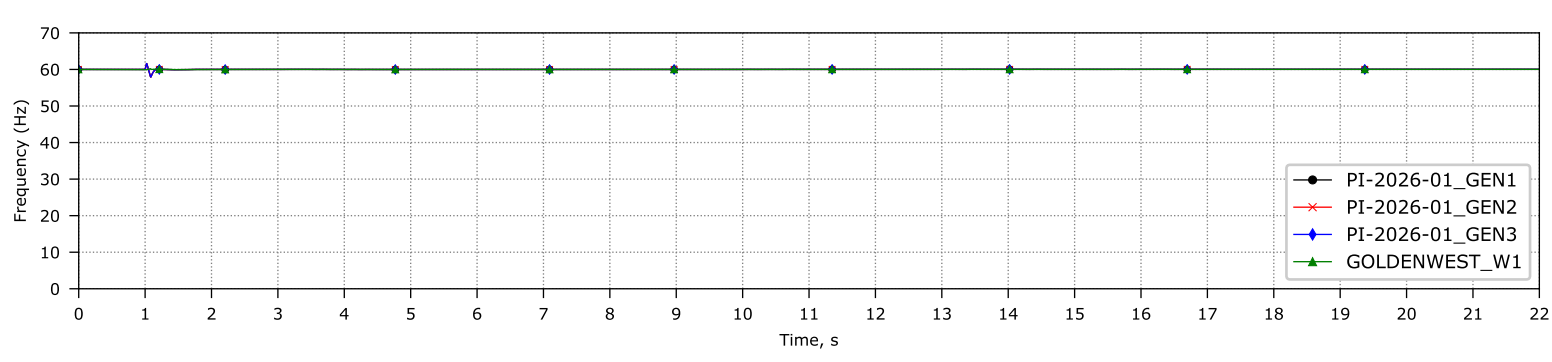

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

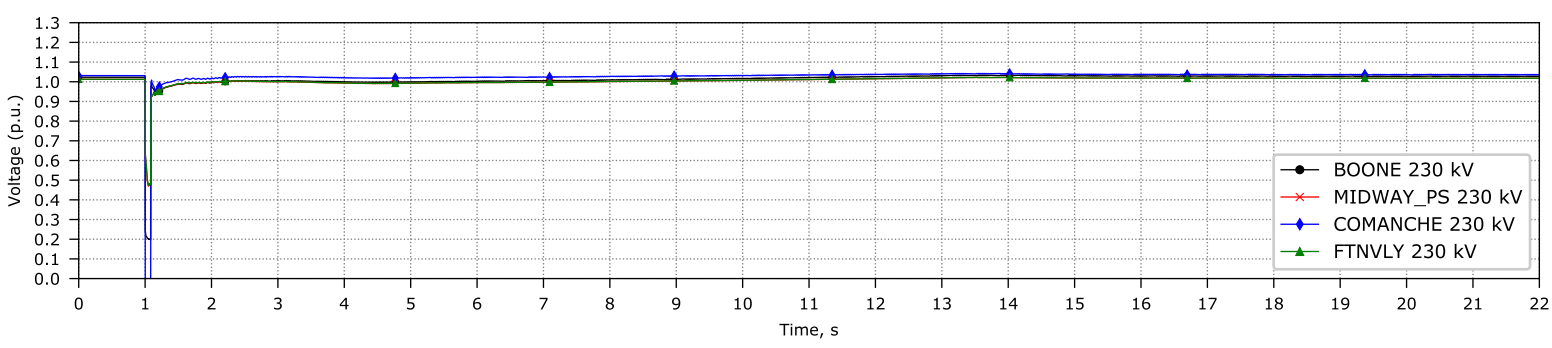

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

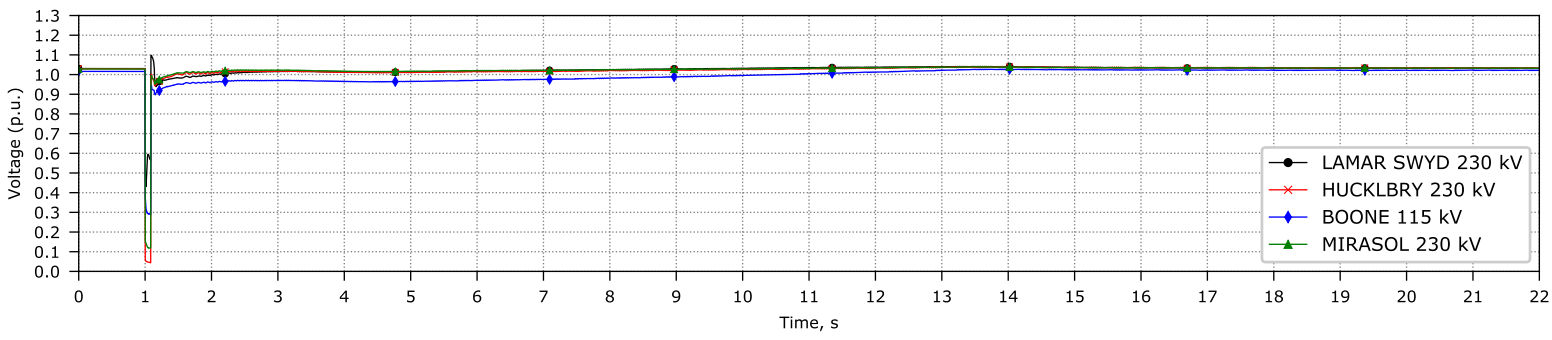

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

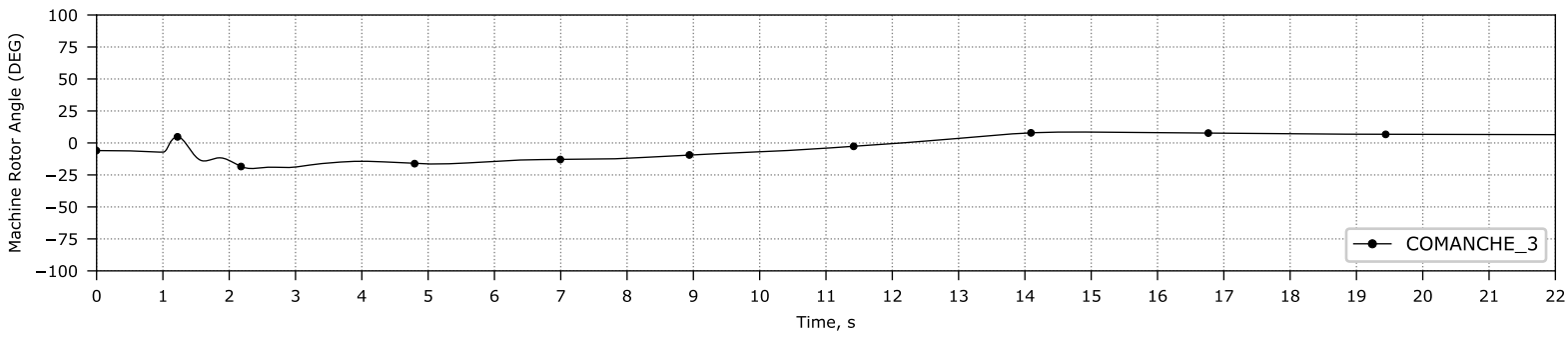

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

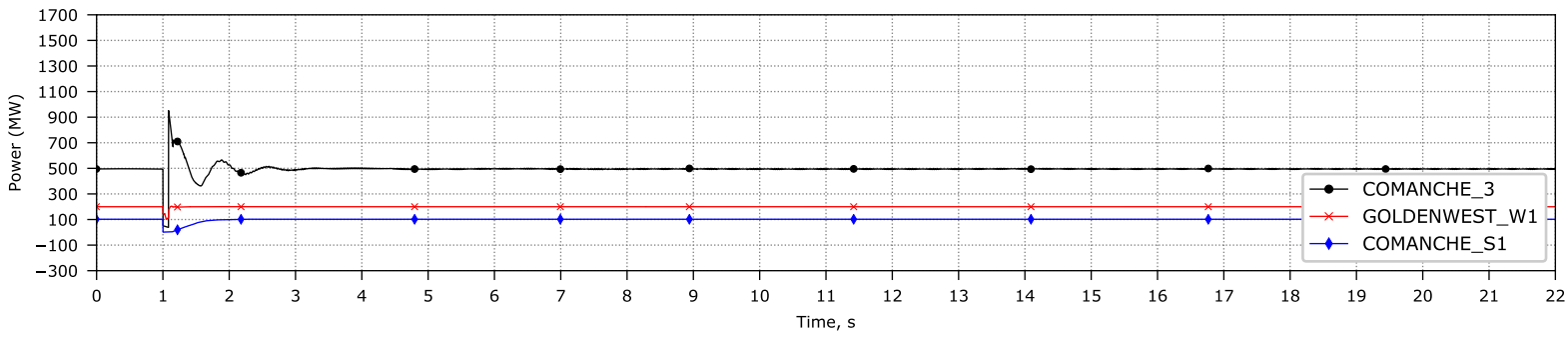

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

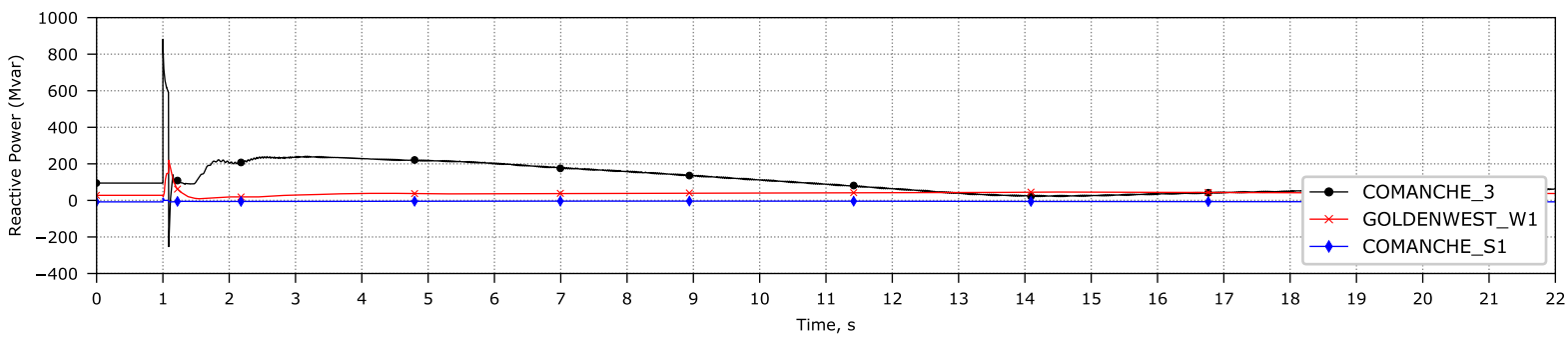

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

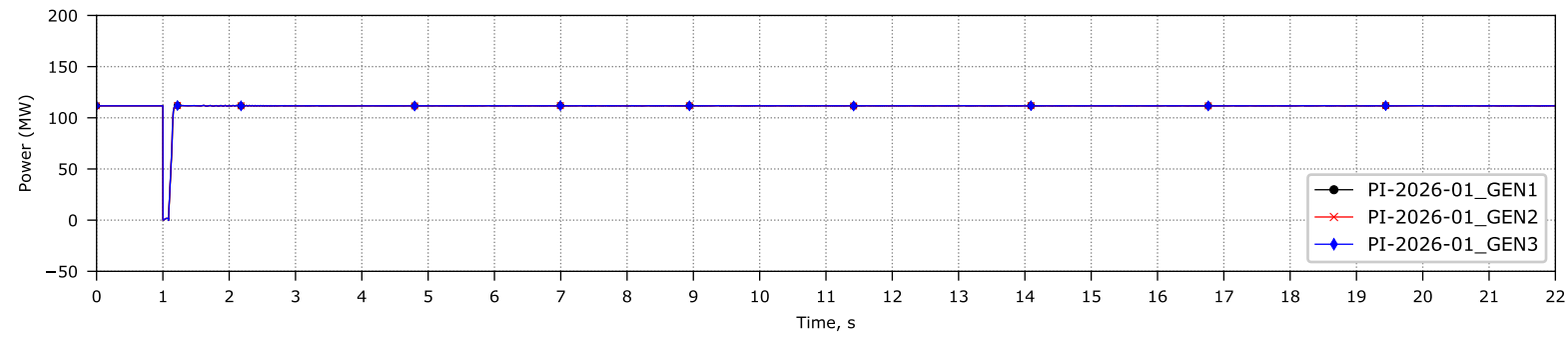

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

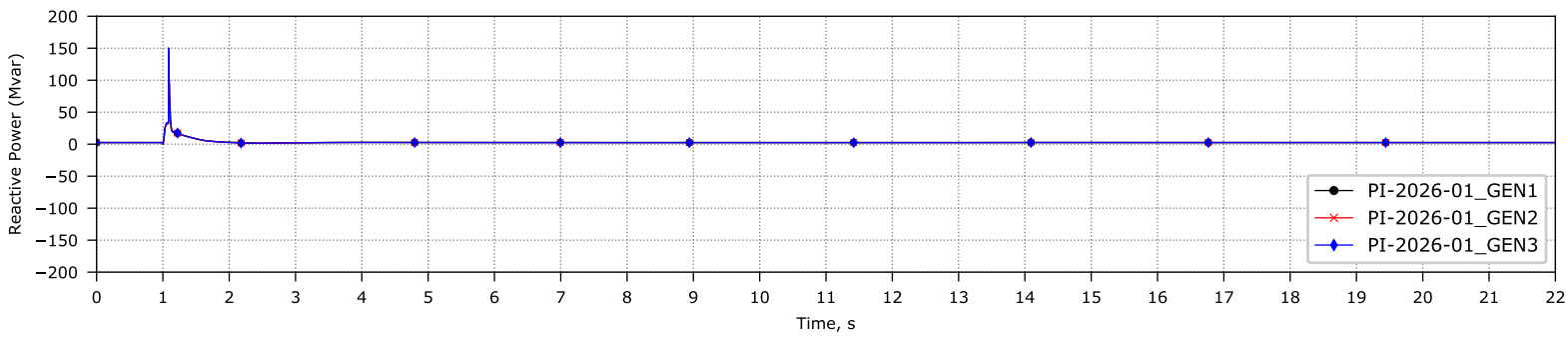
Coman T3

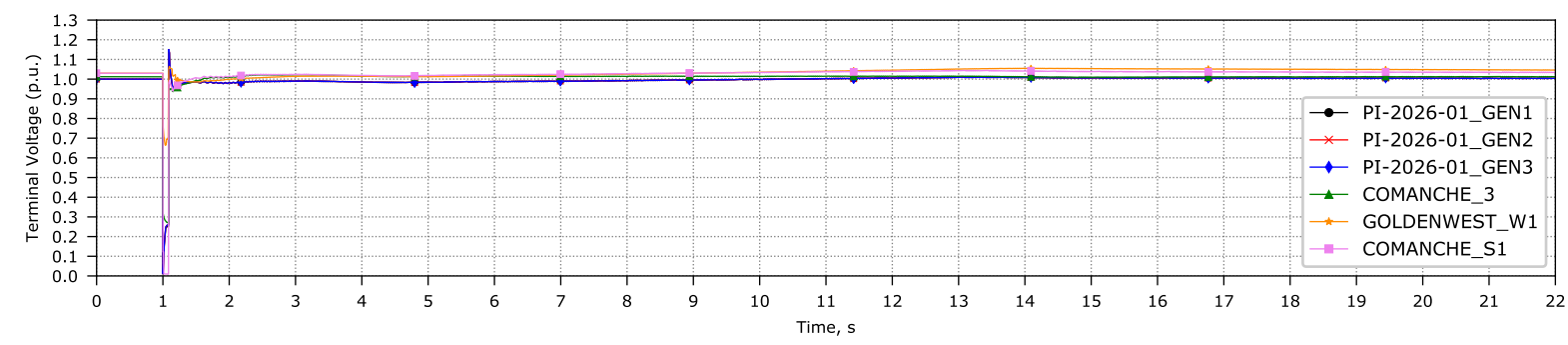

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

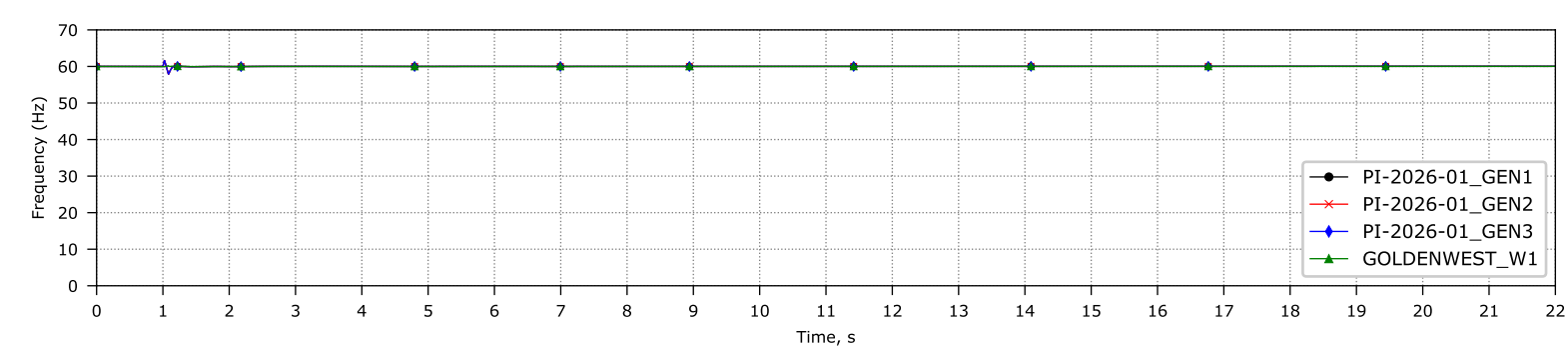

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

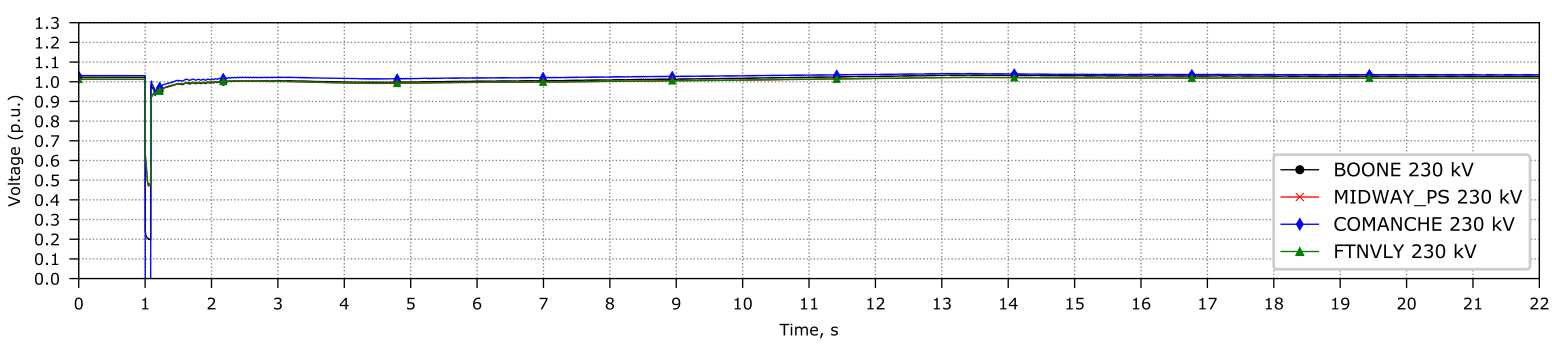

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

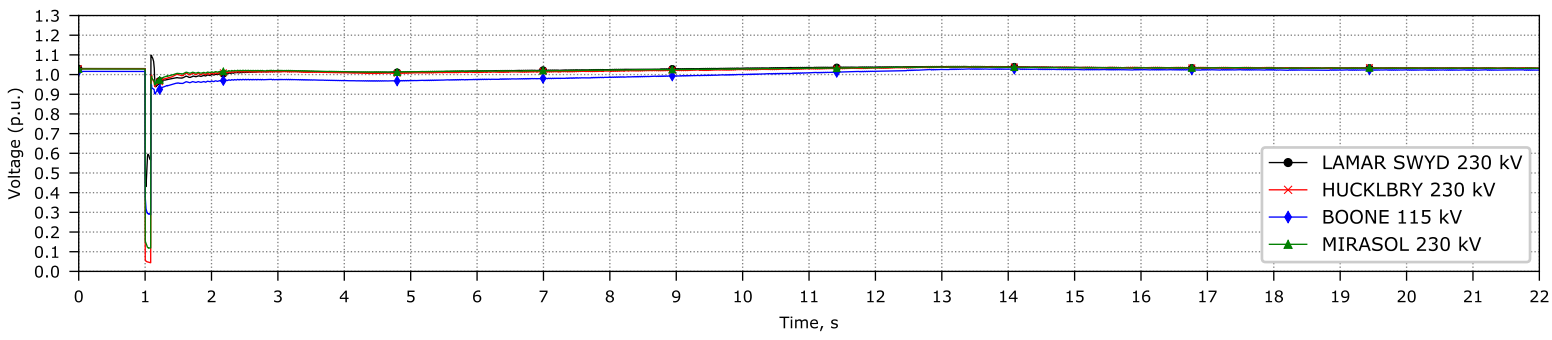

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

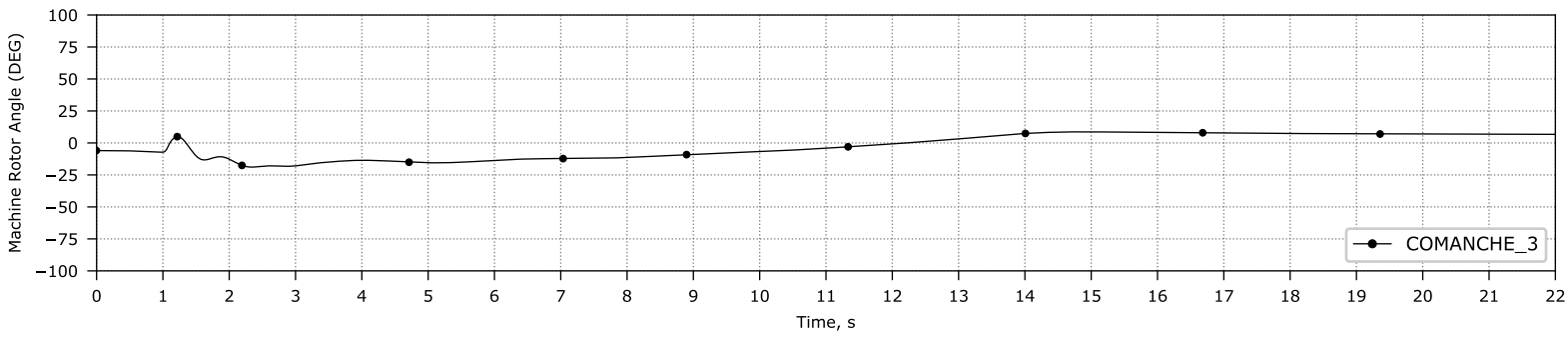

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

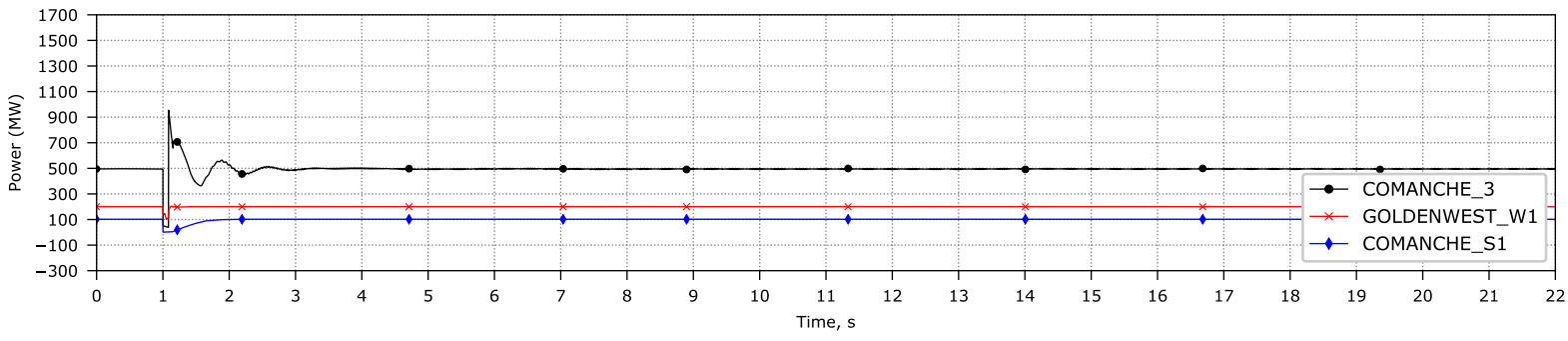

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

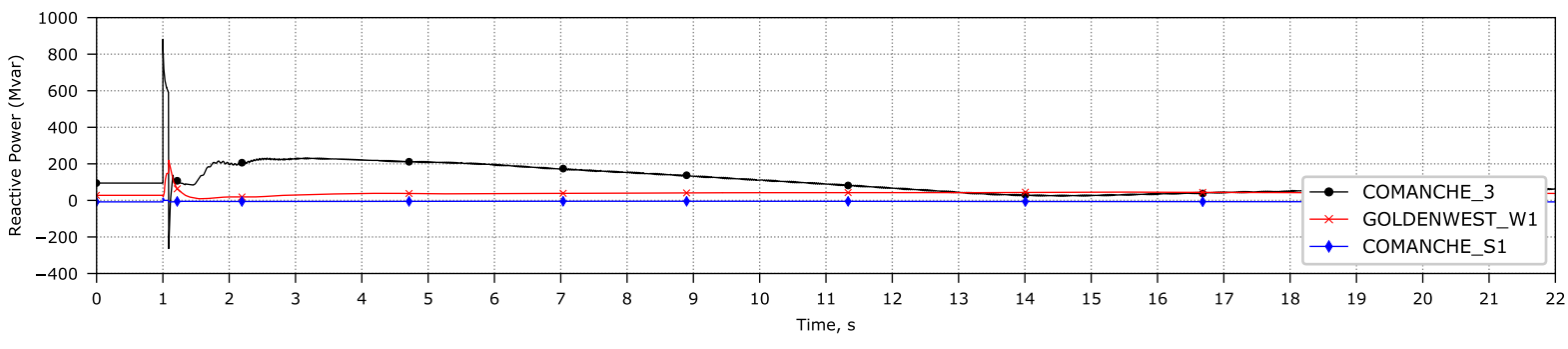

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

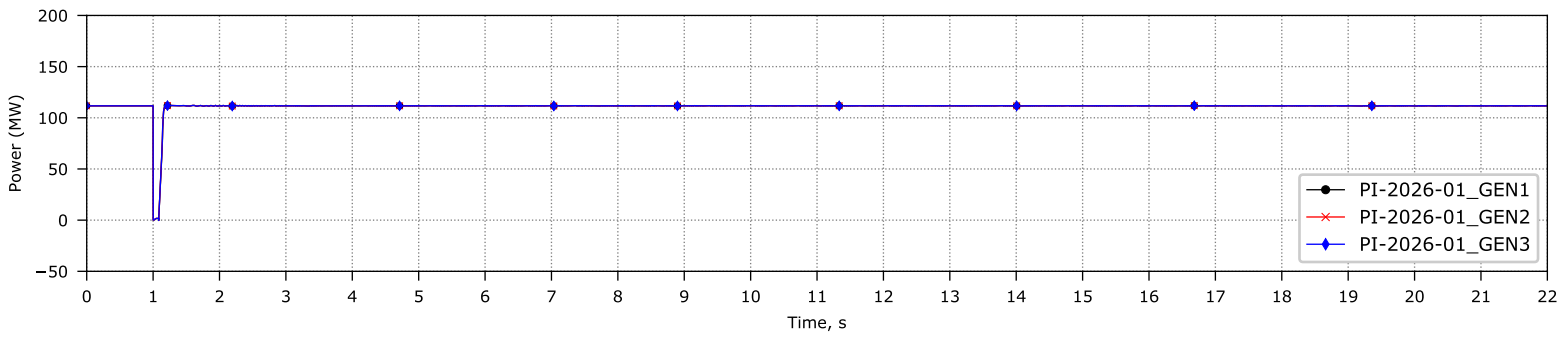

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

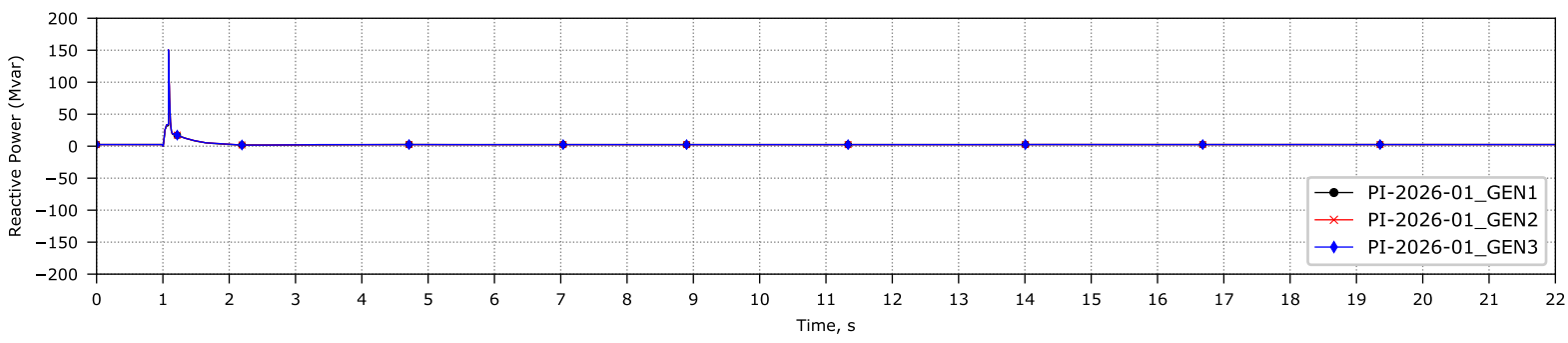
Coman T2

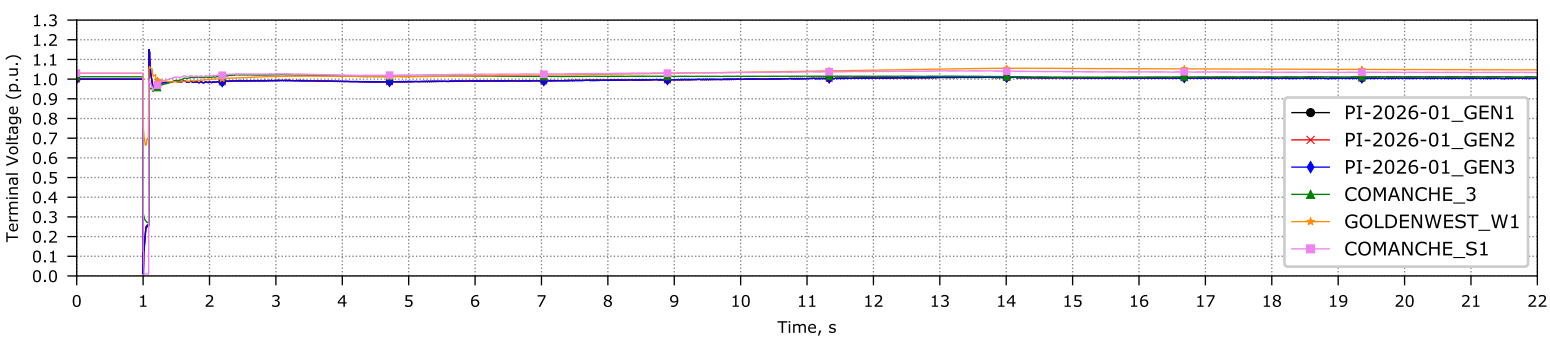

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

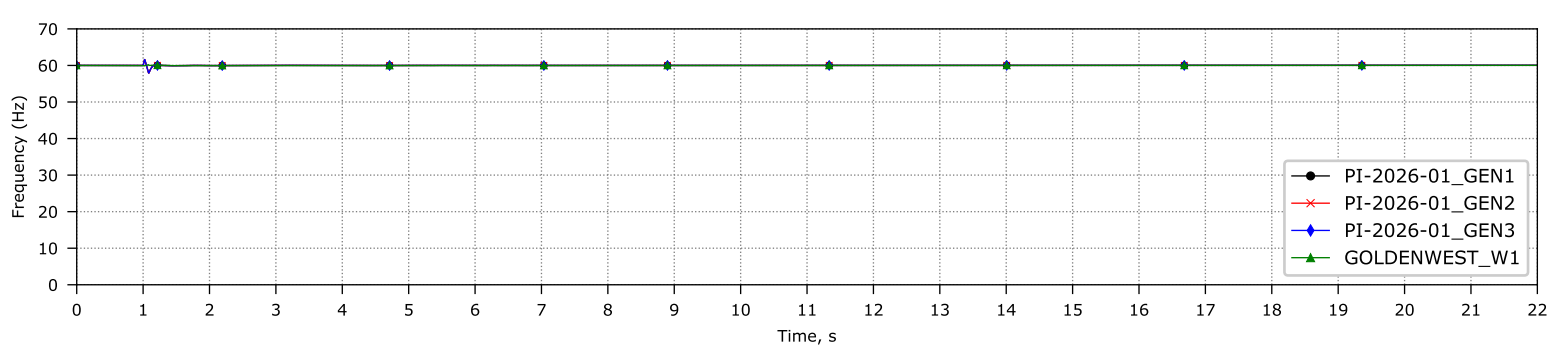

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

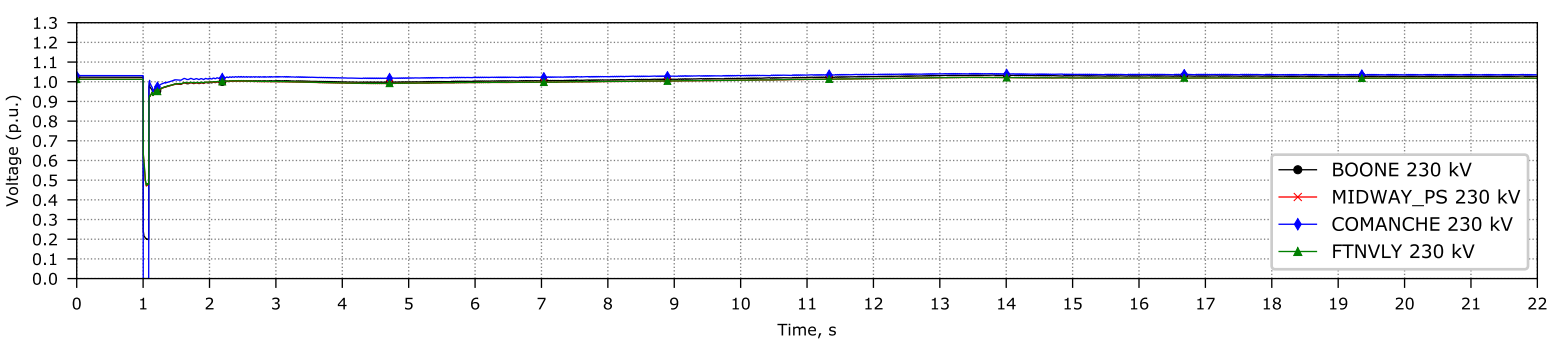

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

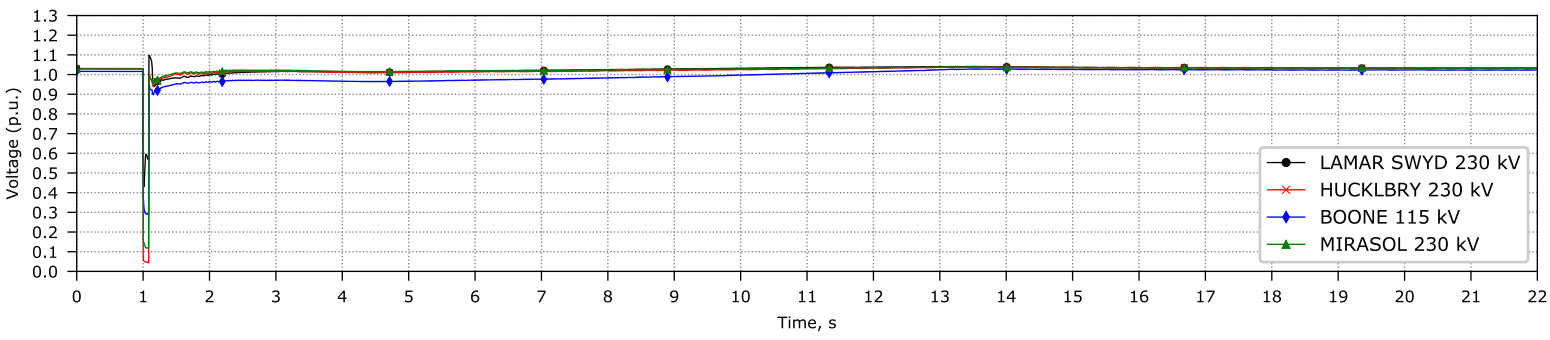

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

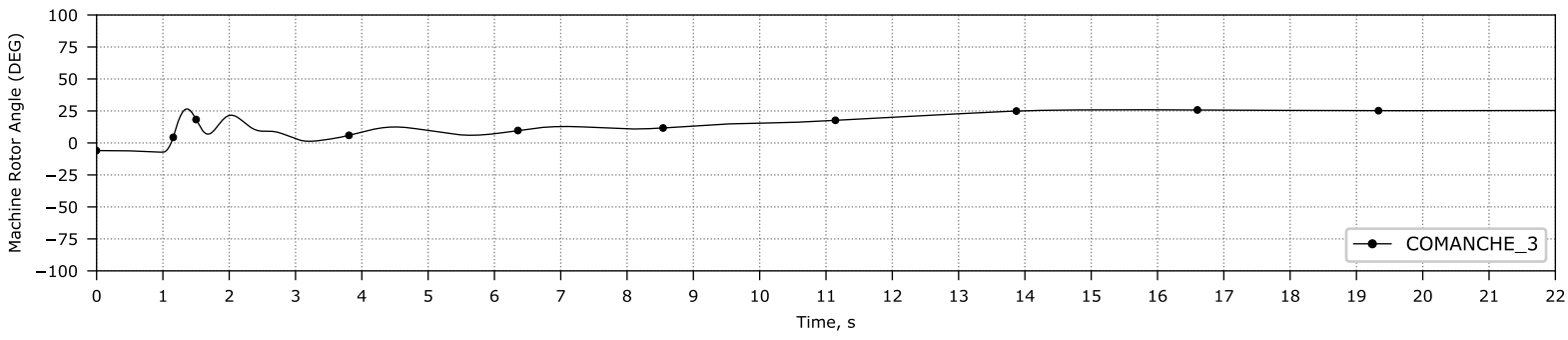

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

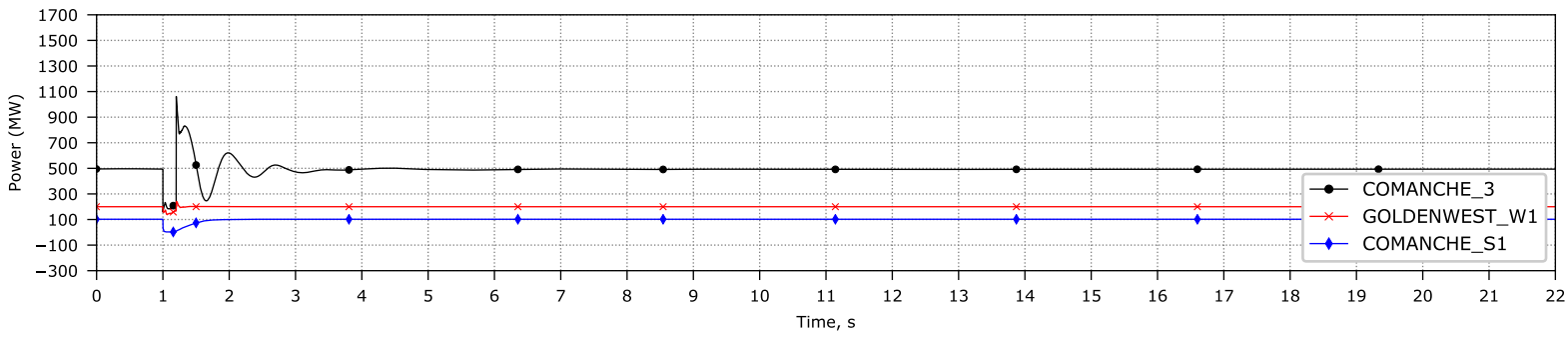

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

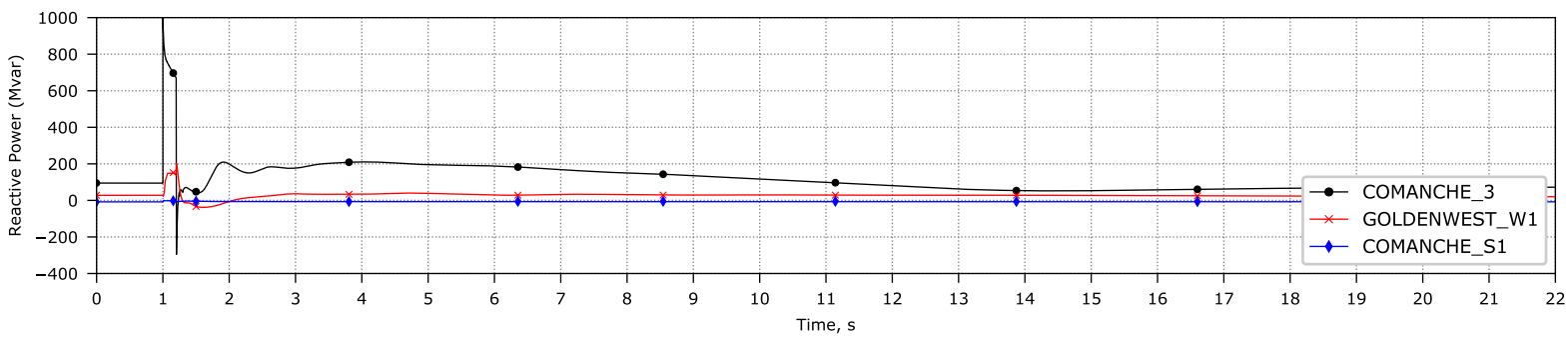

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

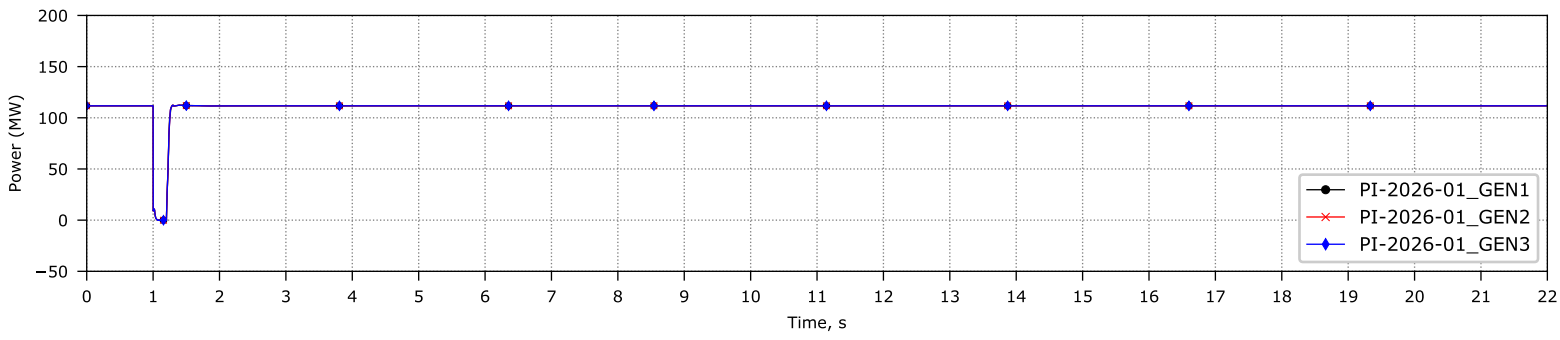

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

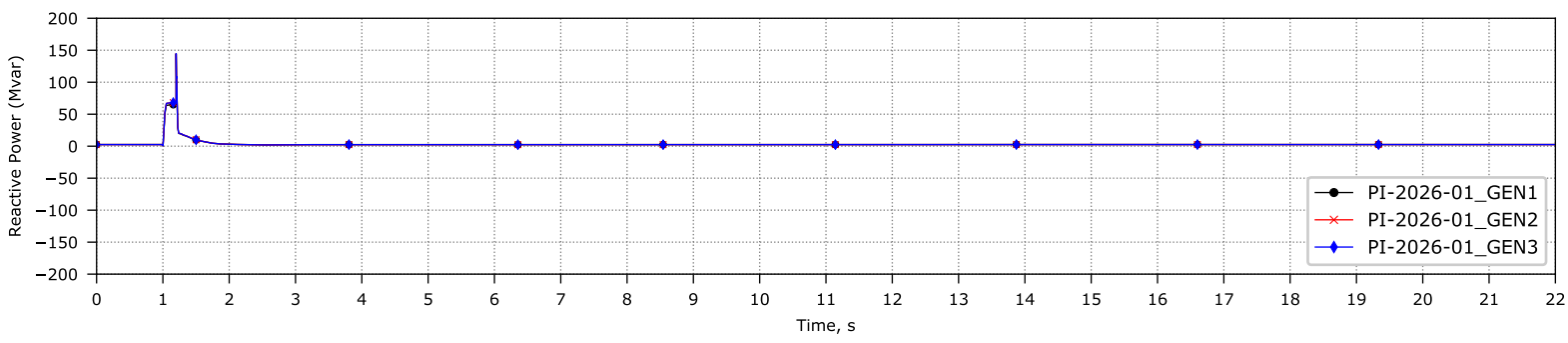
BF_039e

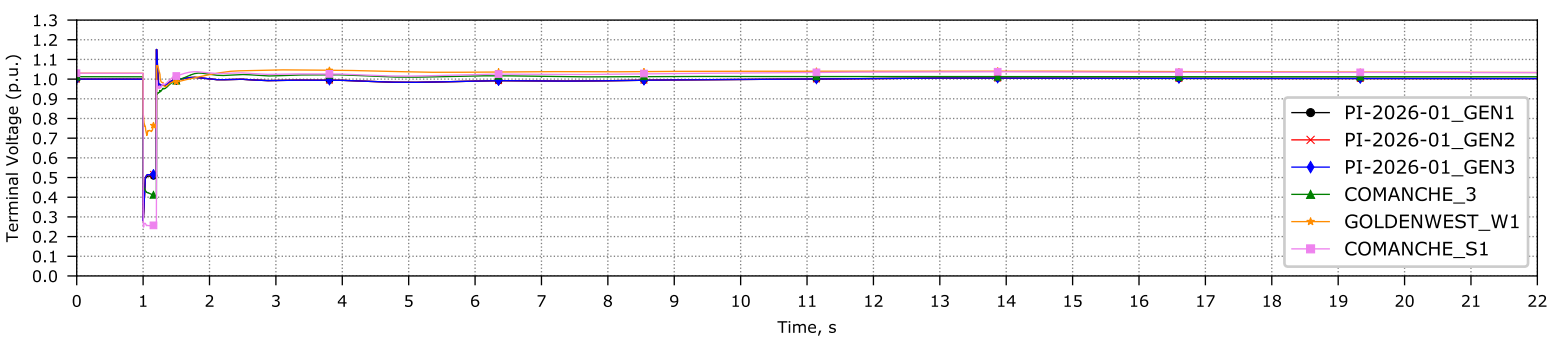

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

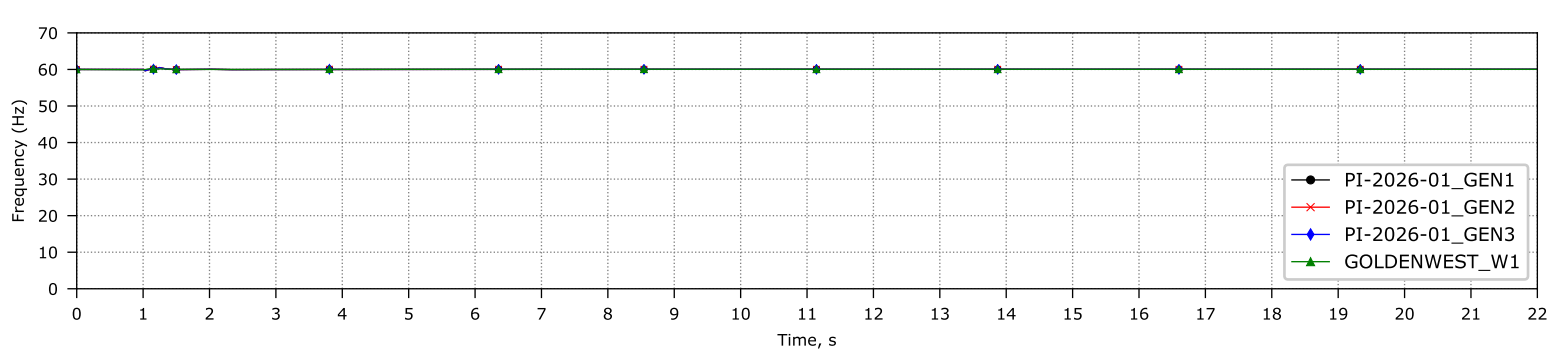

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

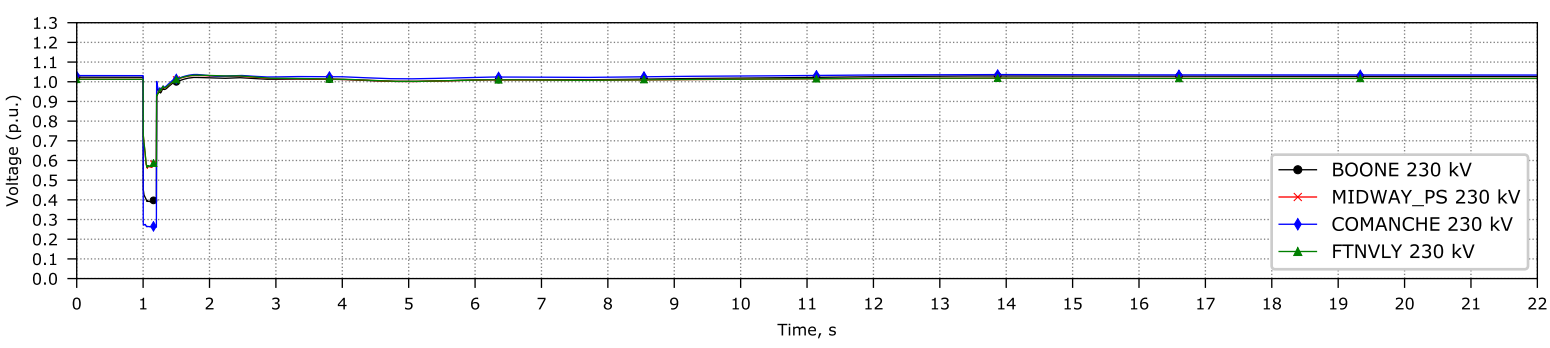

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

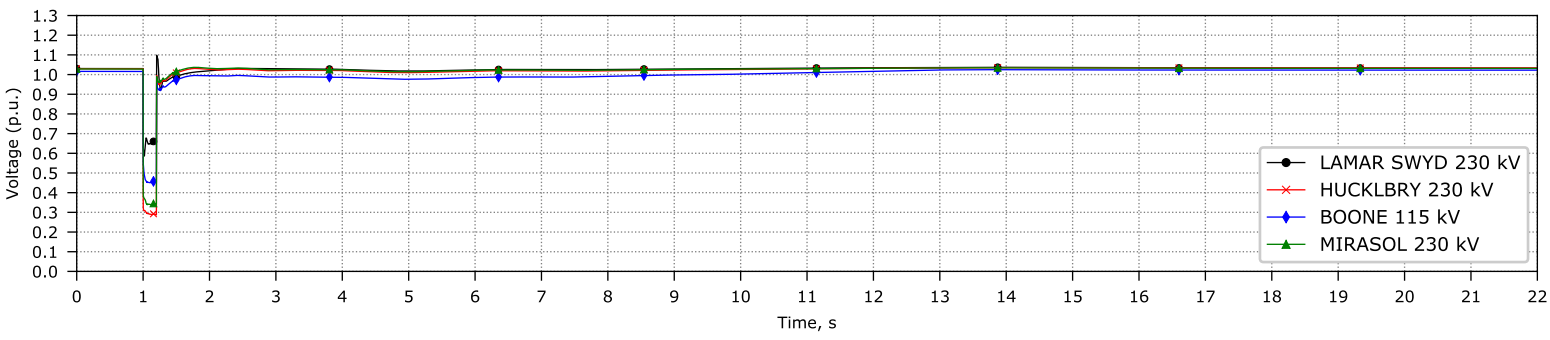

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3

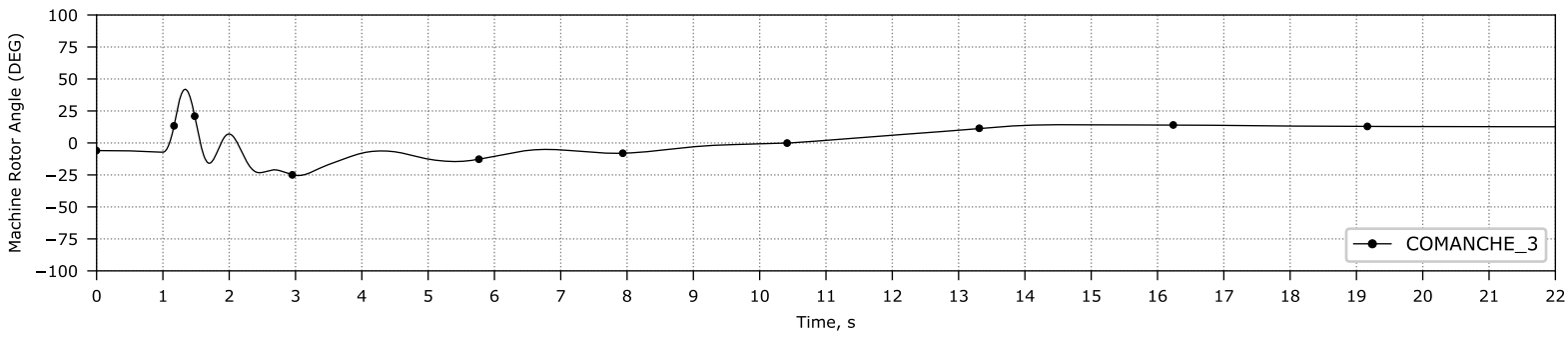

Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

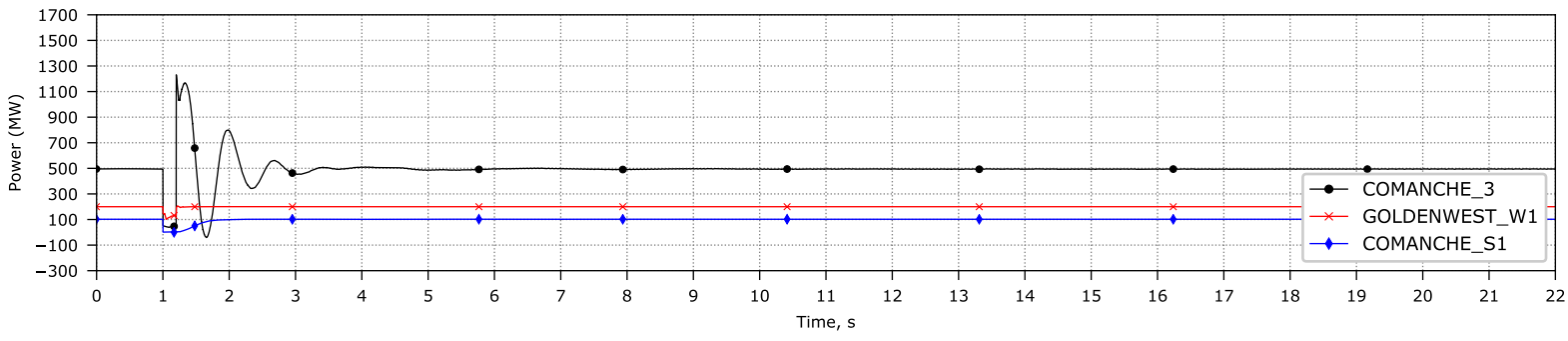

Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1

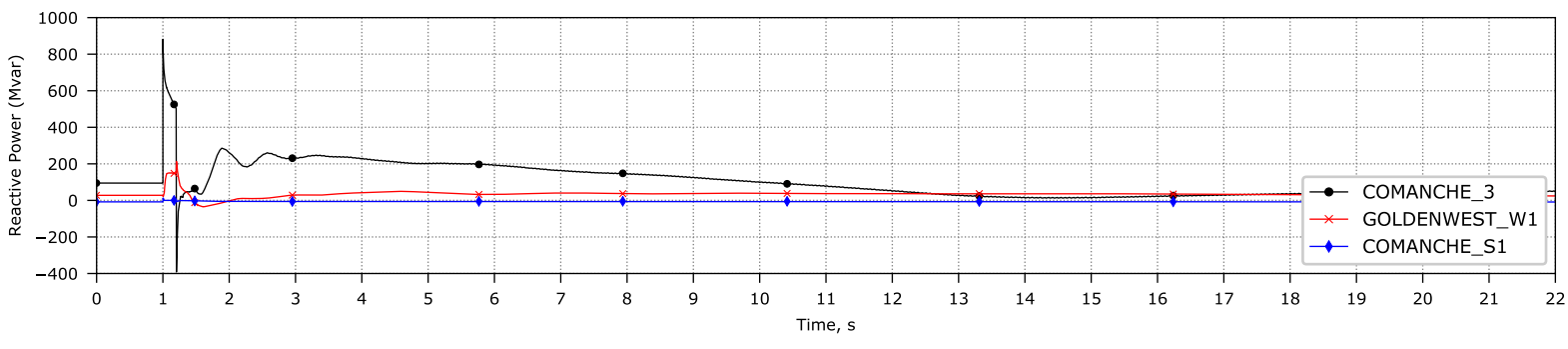

Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV

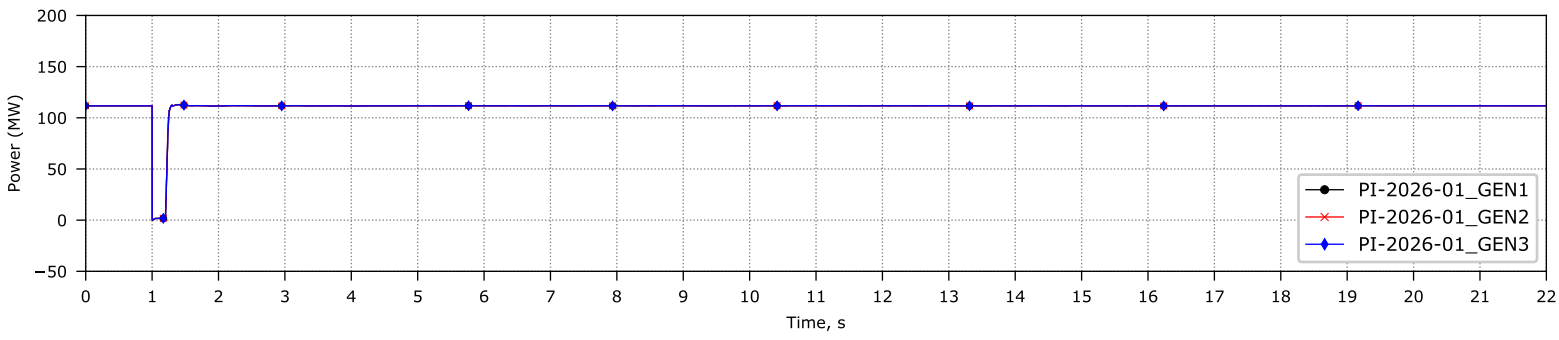

Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

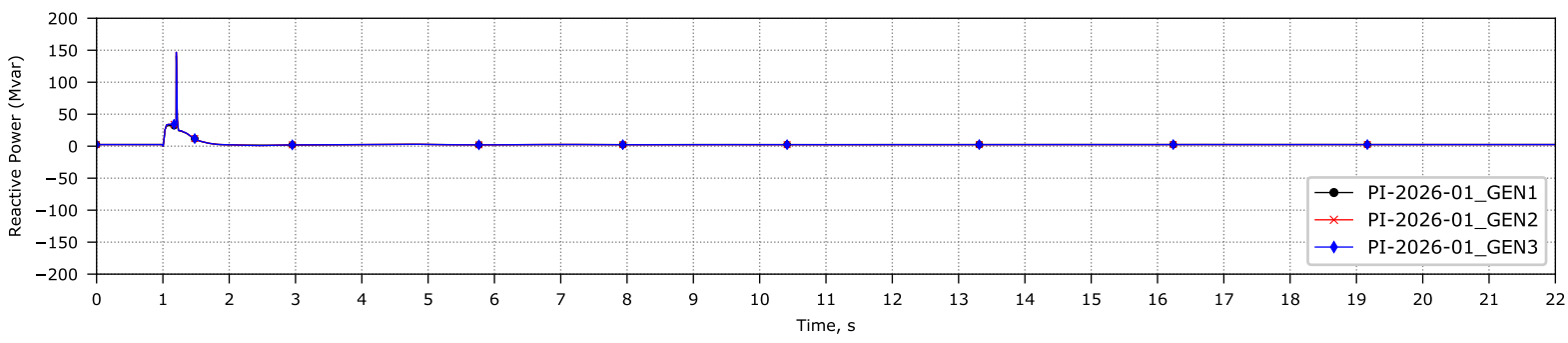
BF_039g

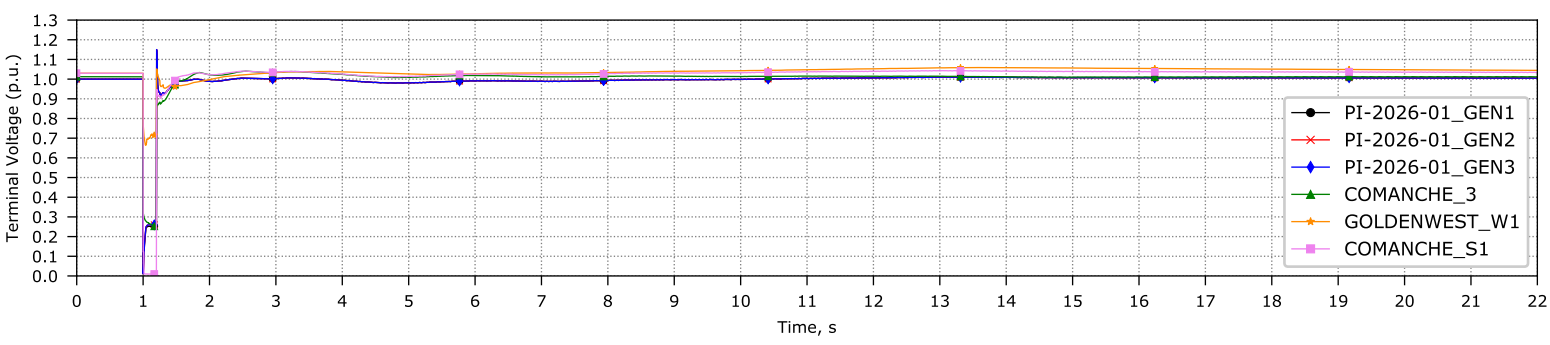

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

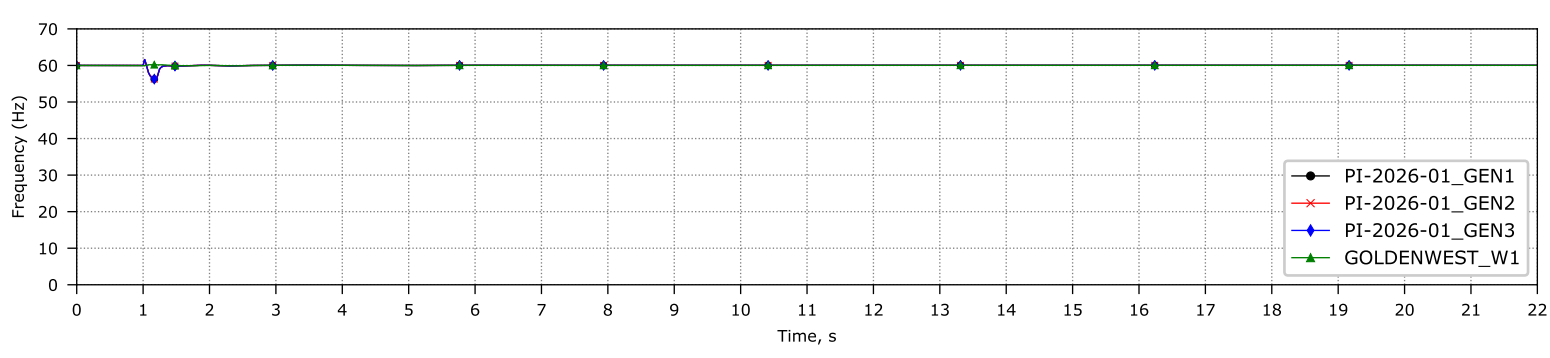

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

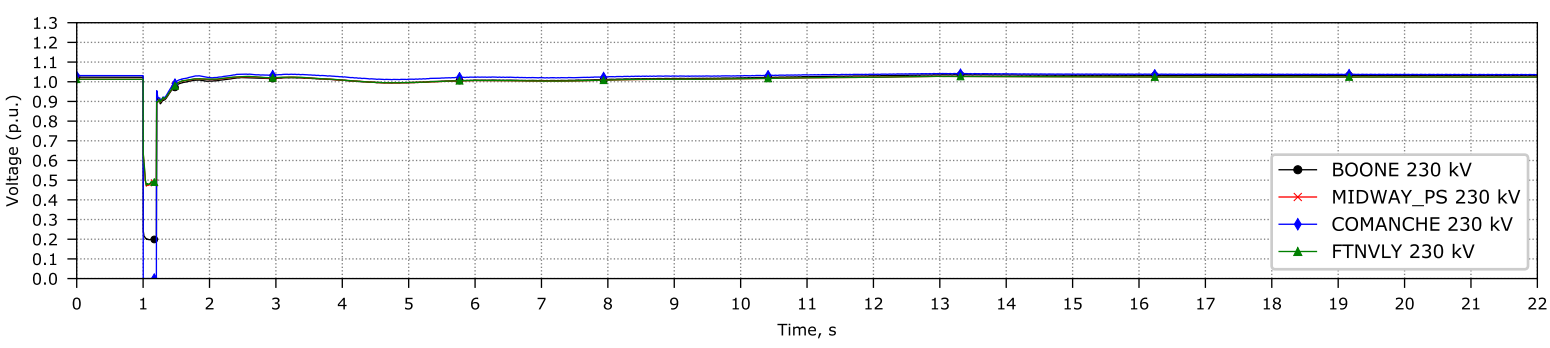

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

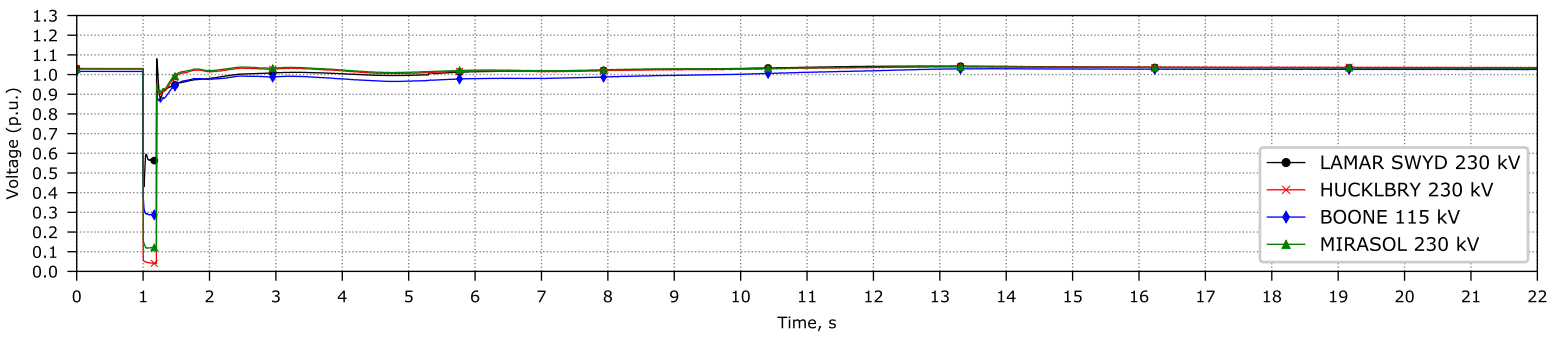

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1


Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1


Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV


Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

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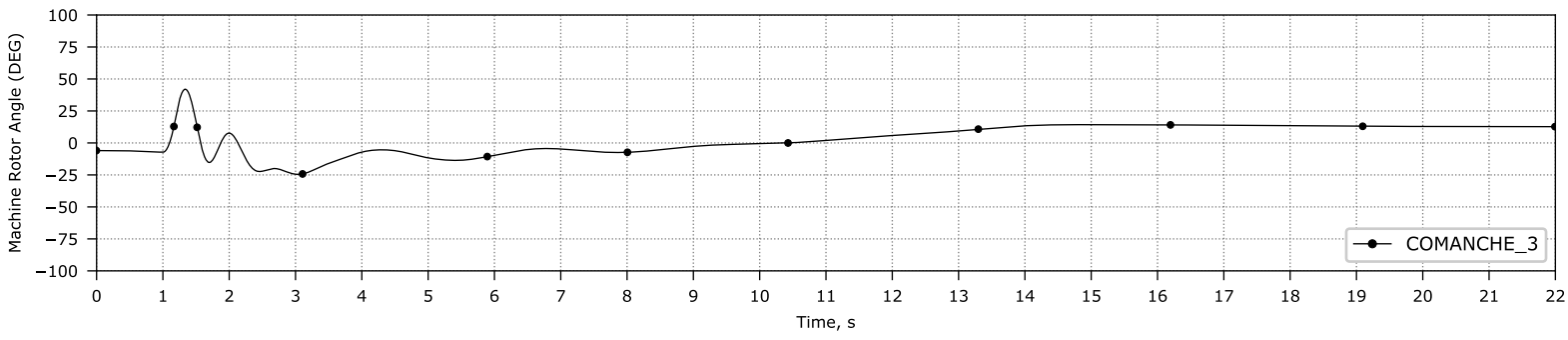
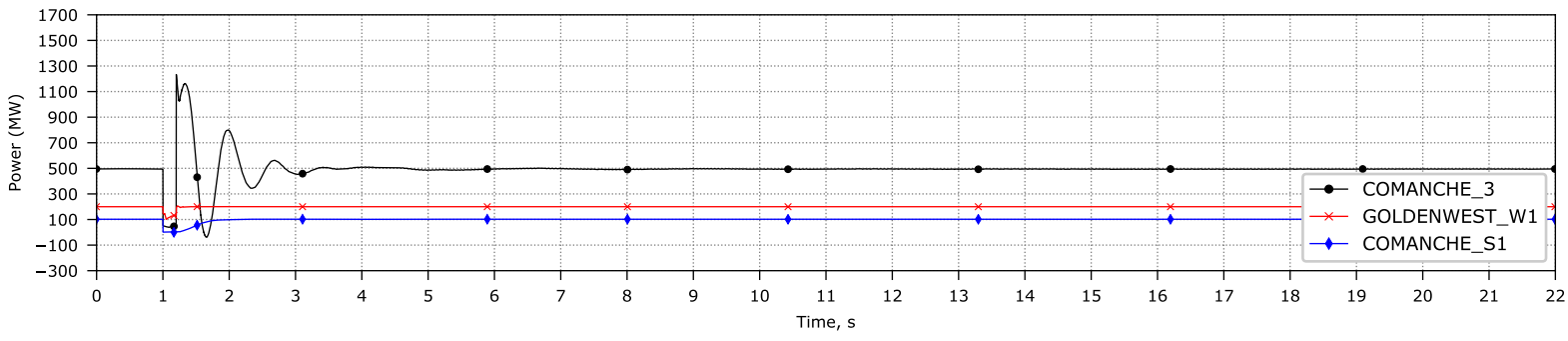
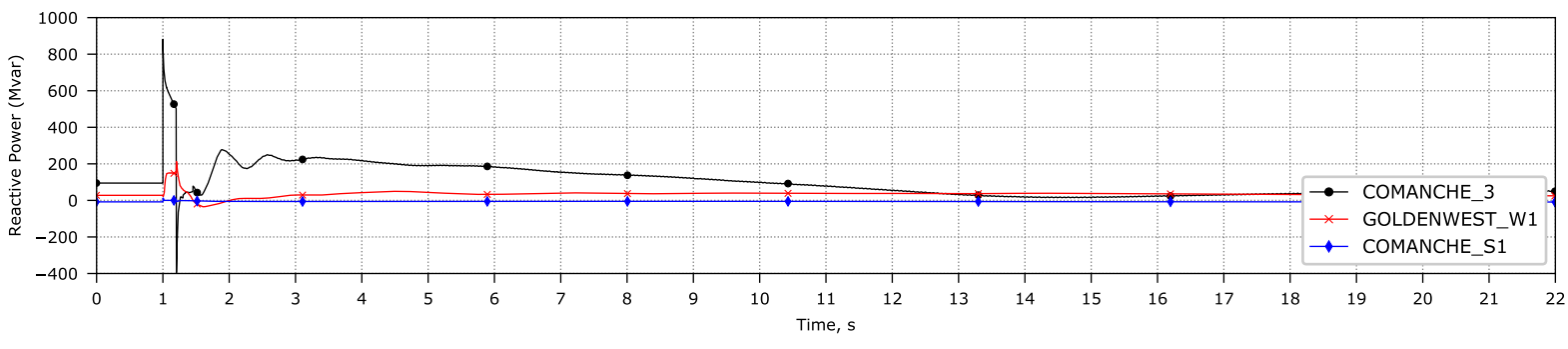
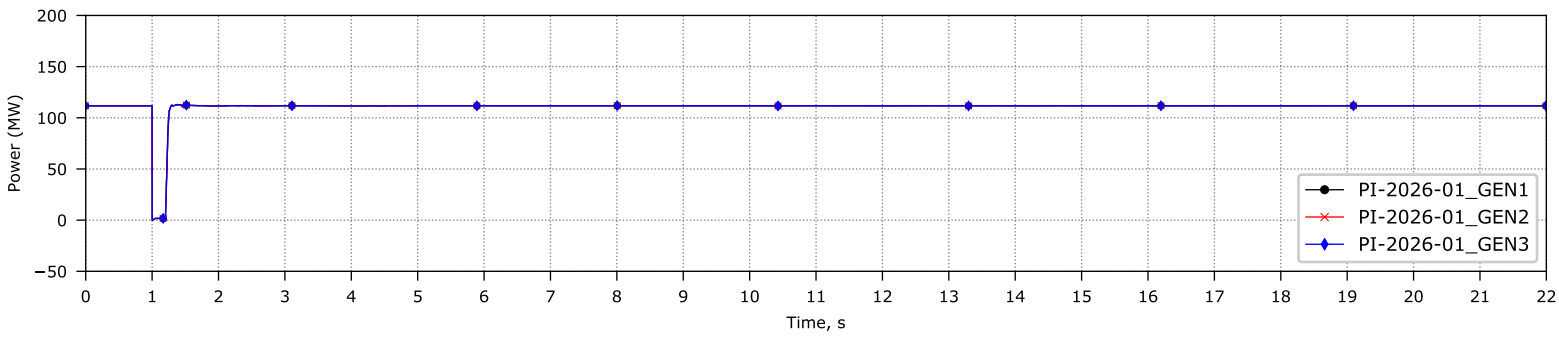
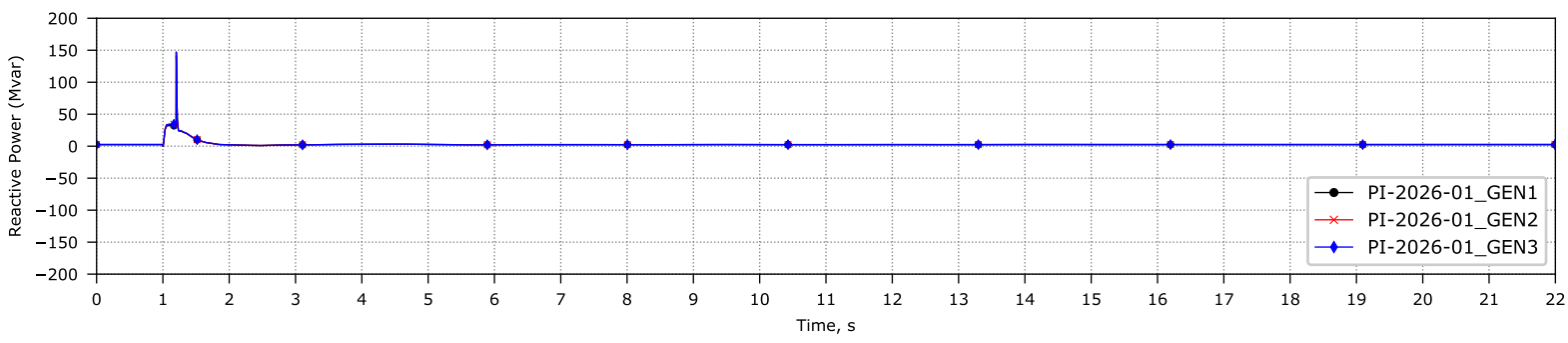
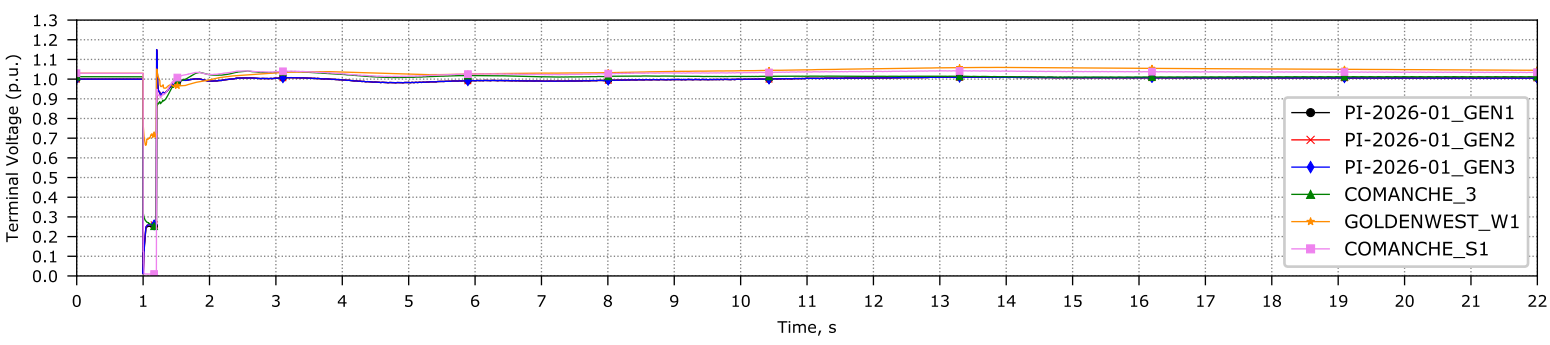

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

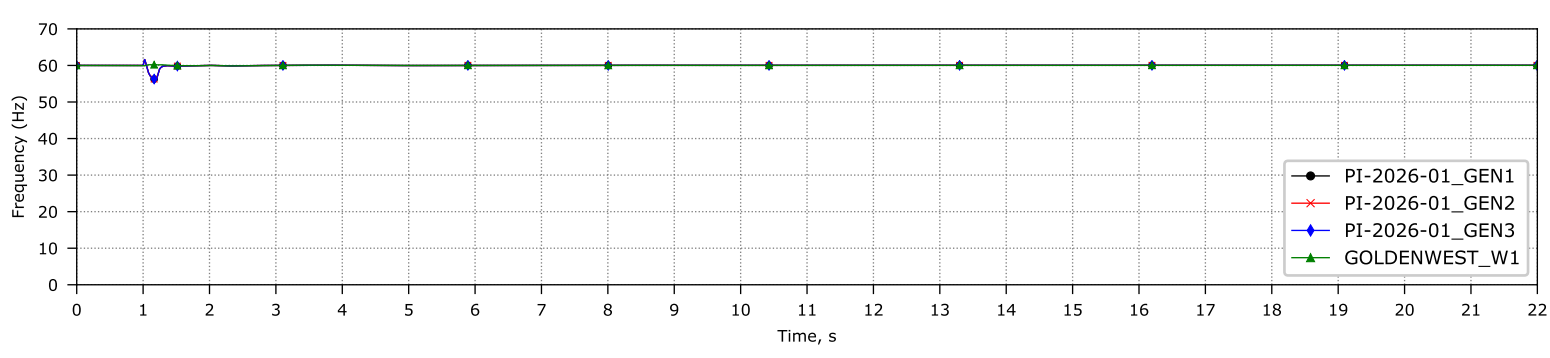

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

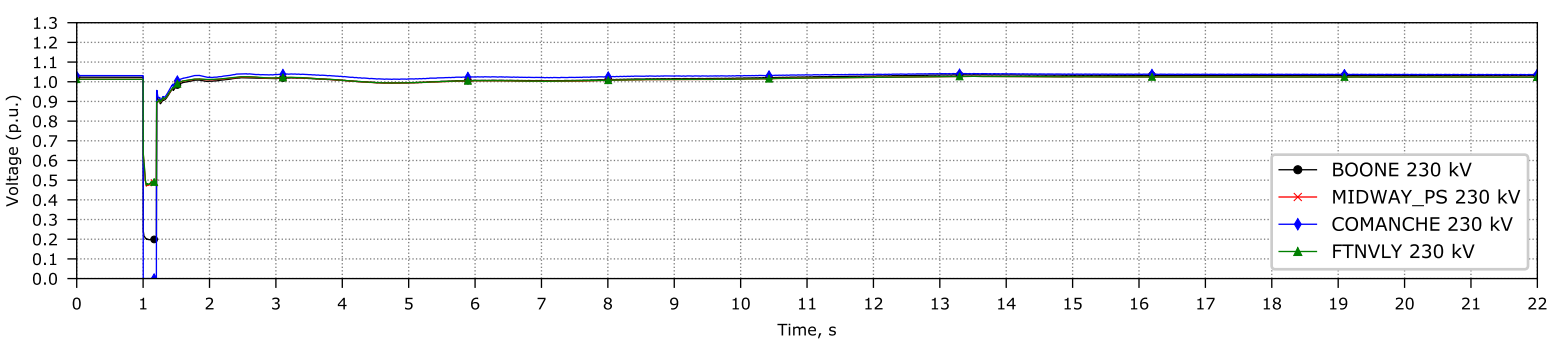

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

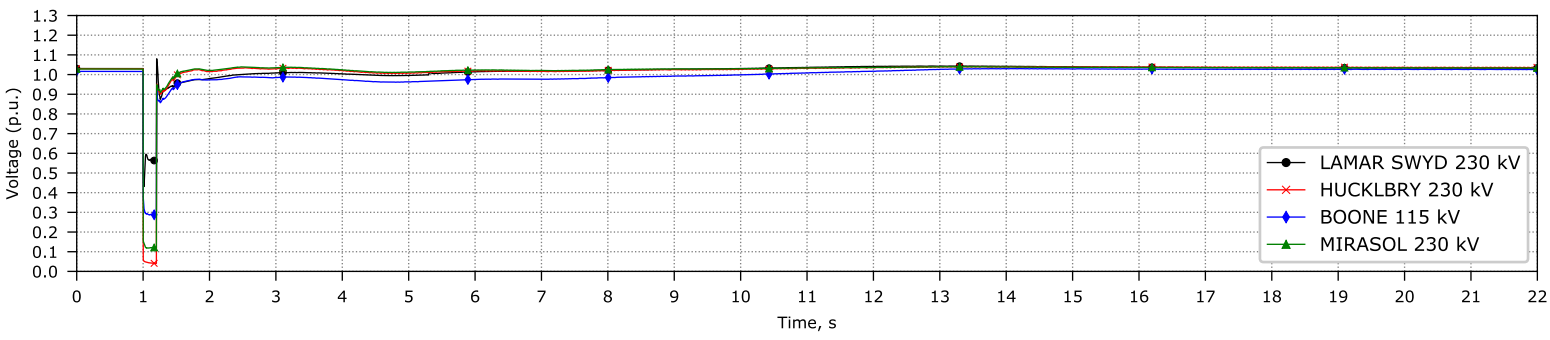

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1


Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1


Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV


Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

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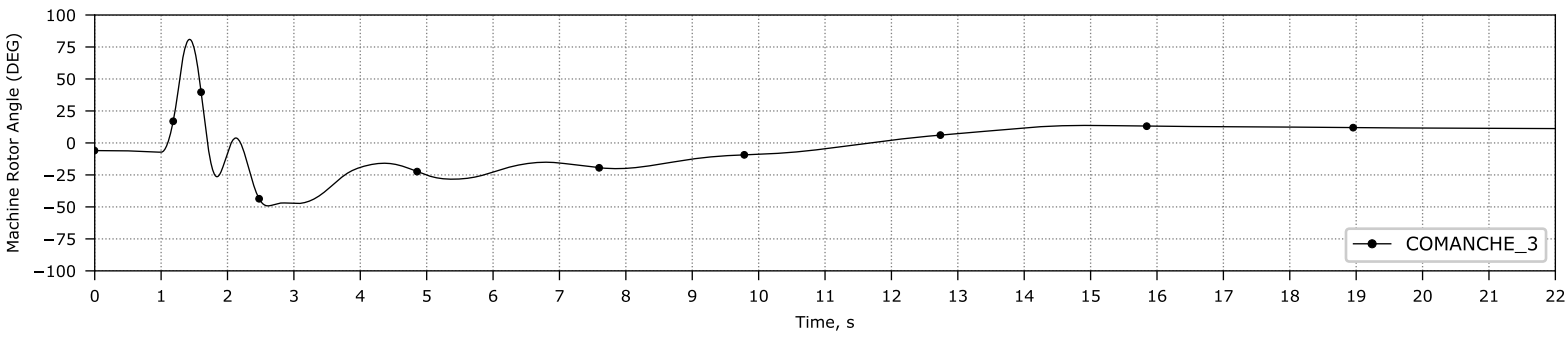
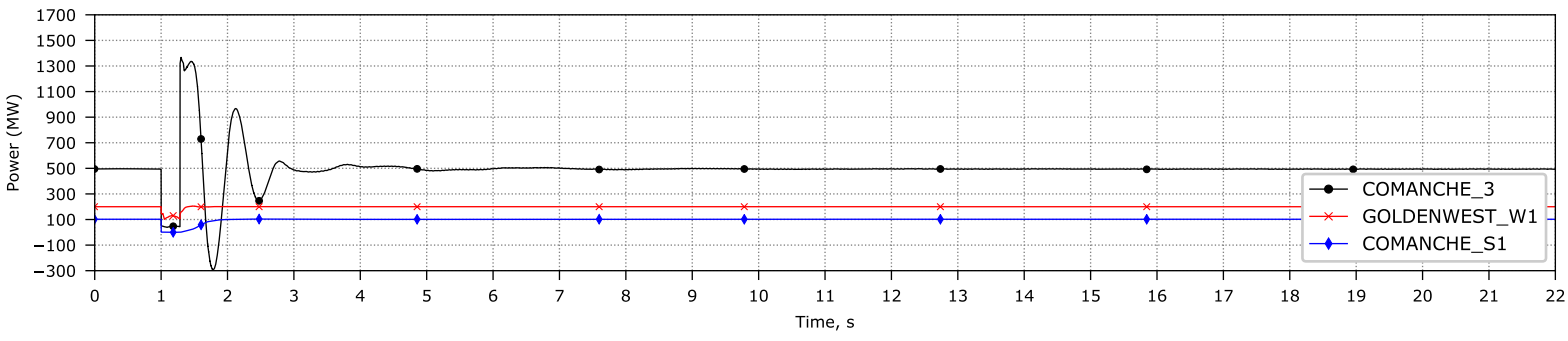
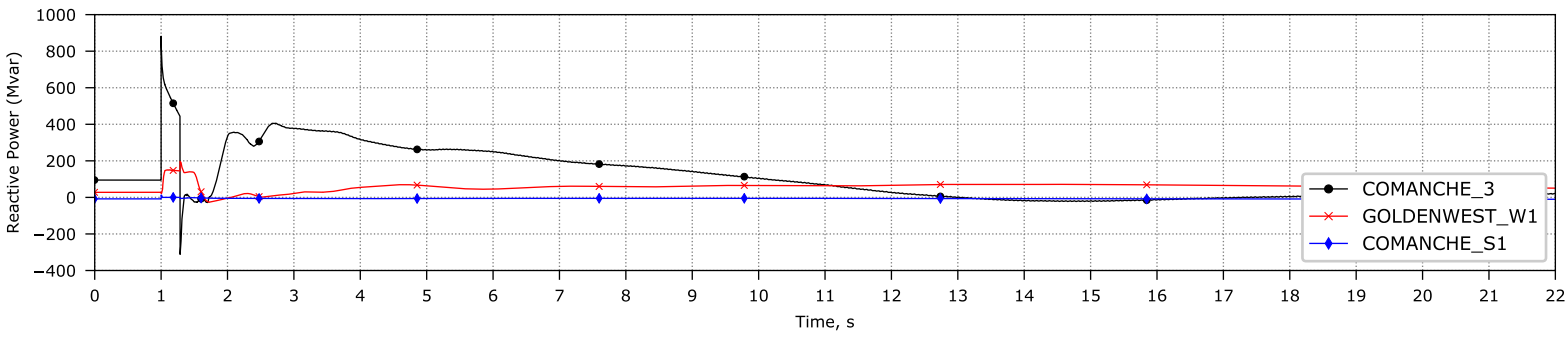
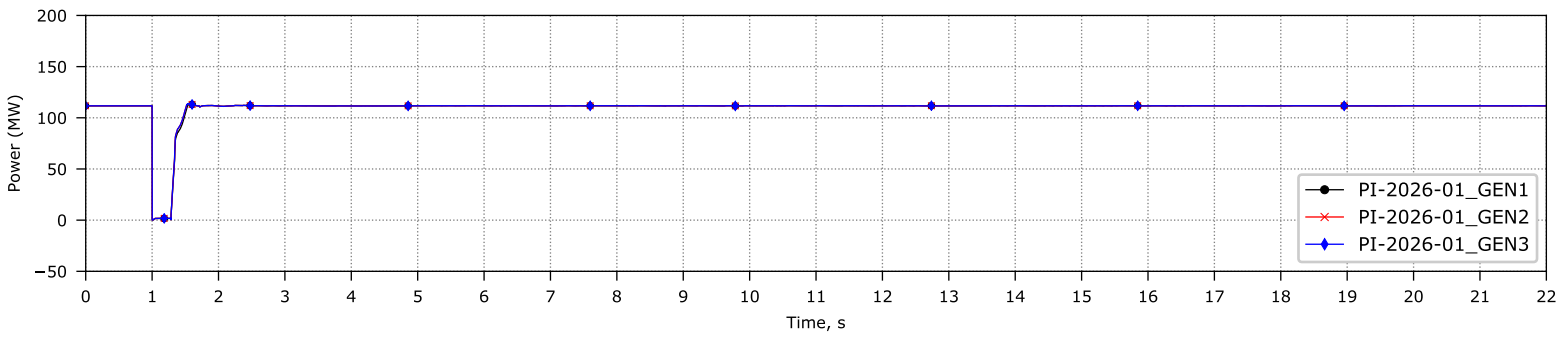
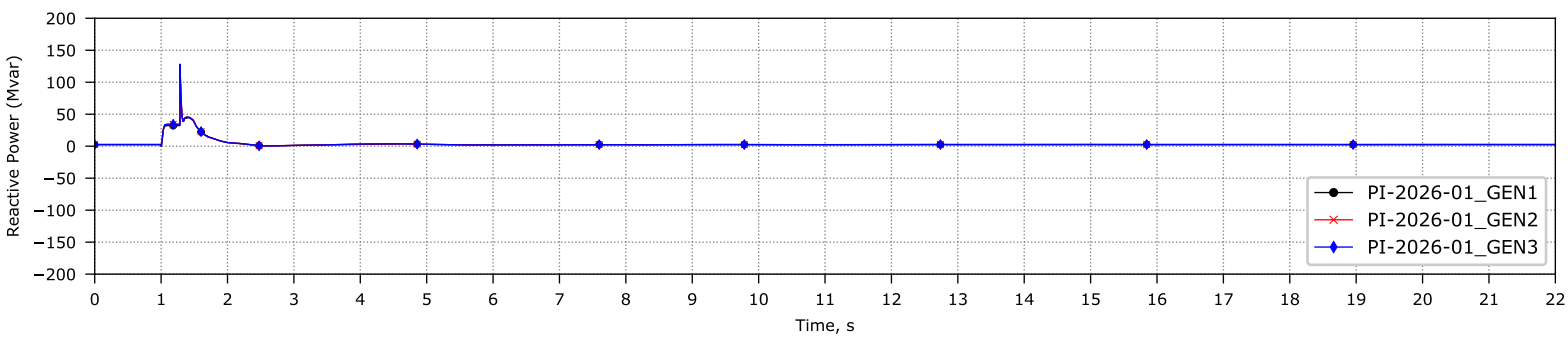
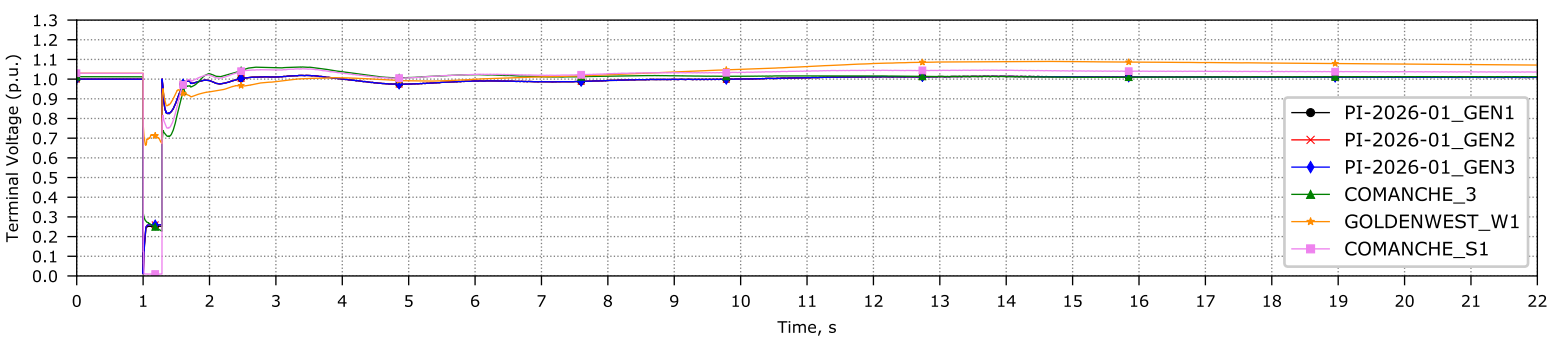

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

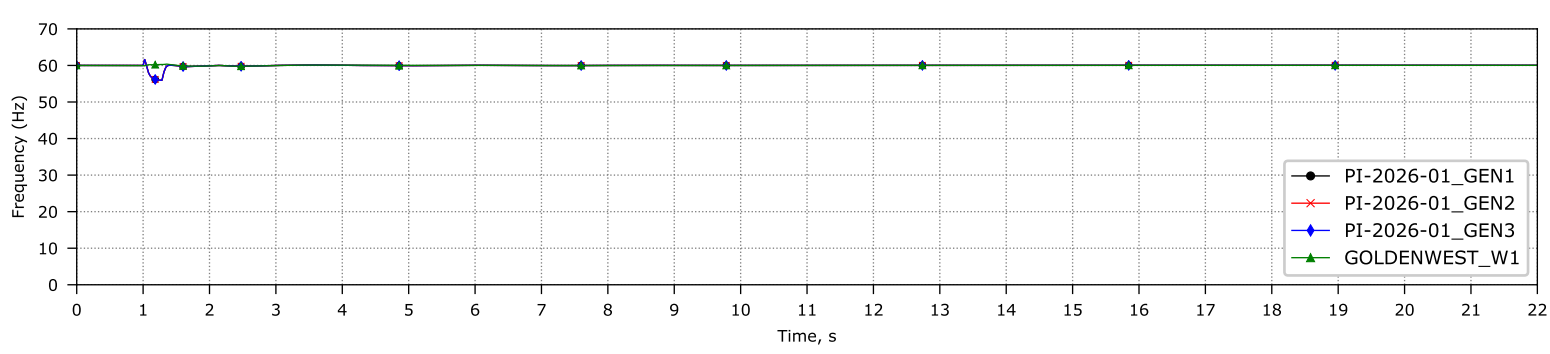

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

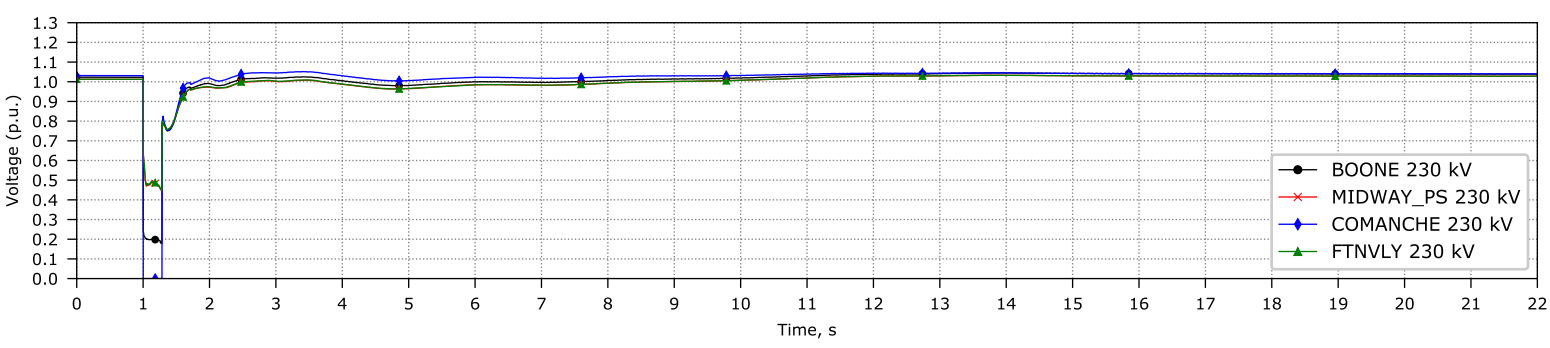

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

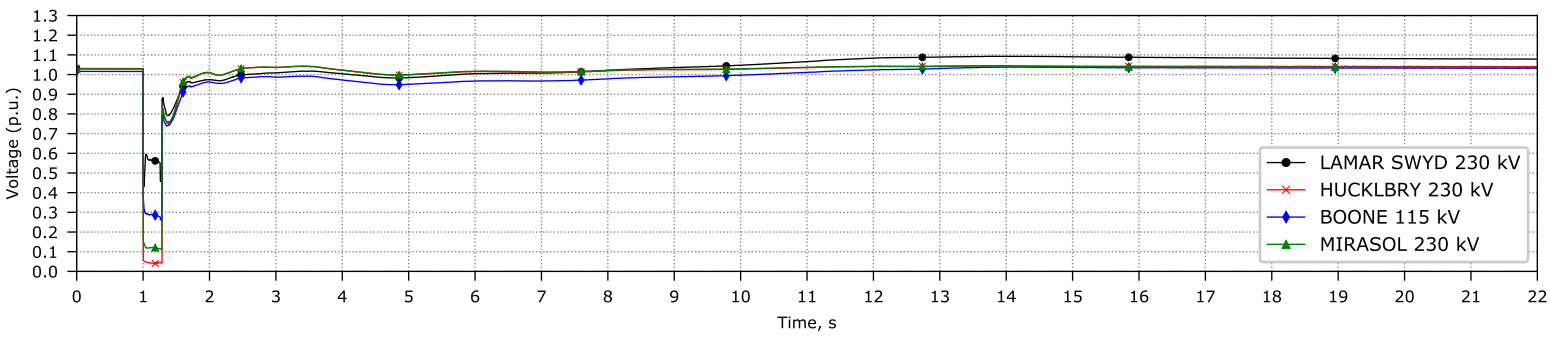

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1


Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1


Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV


Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

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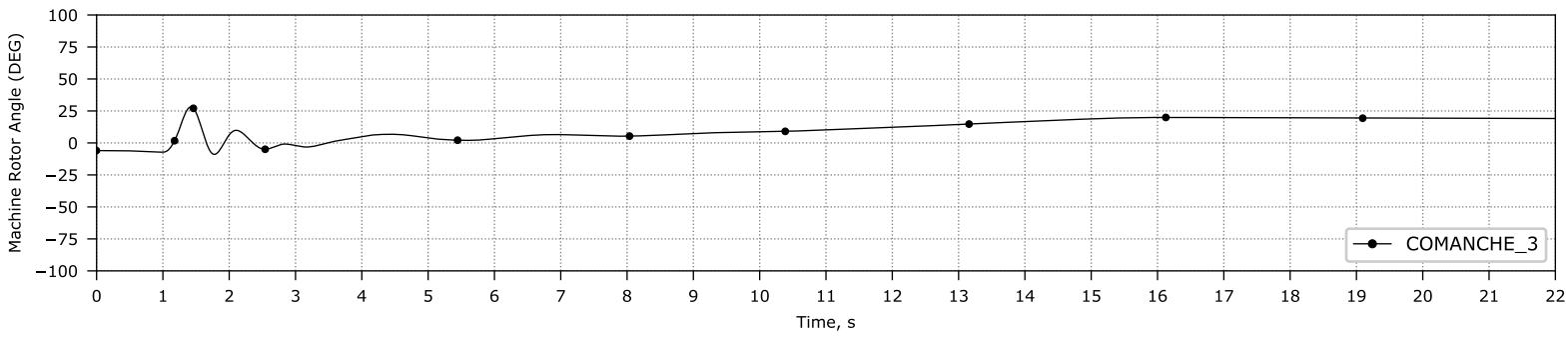
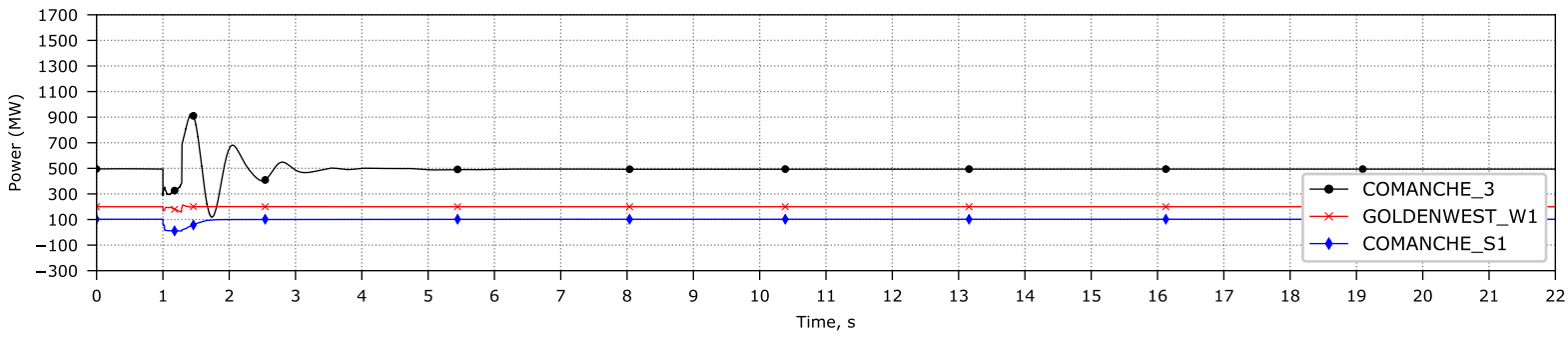
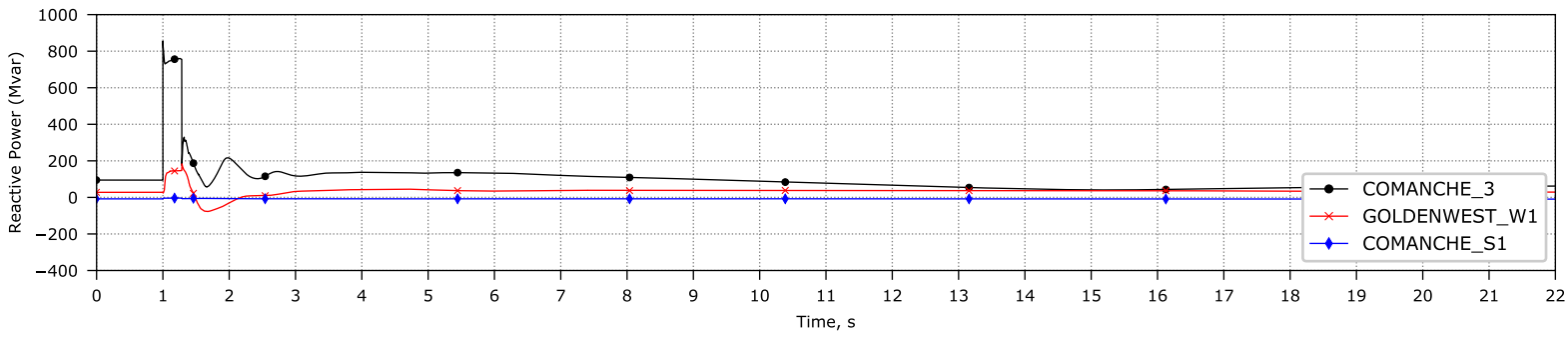
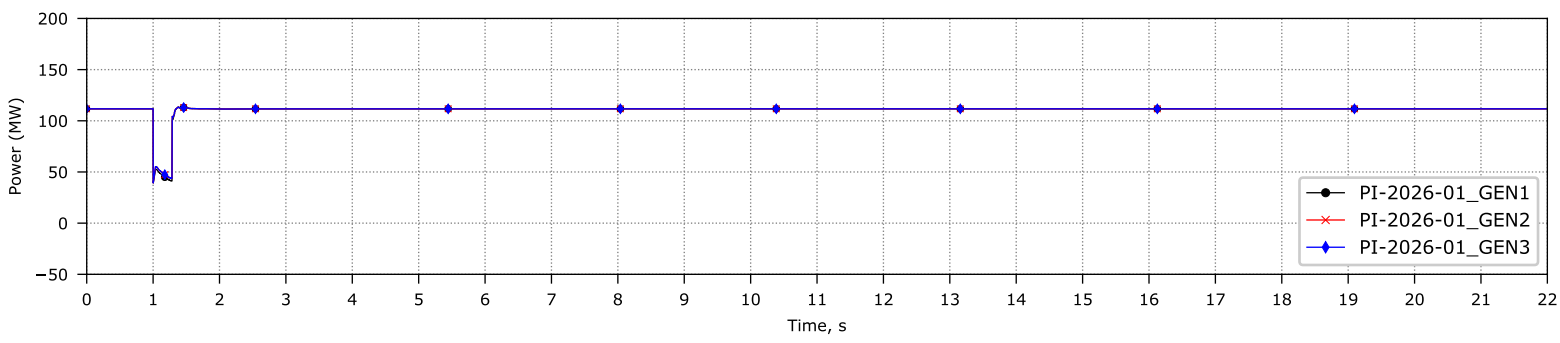
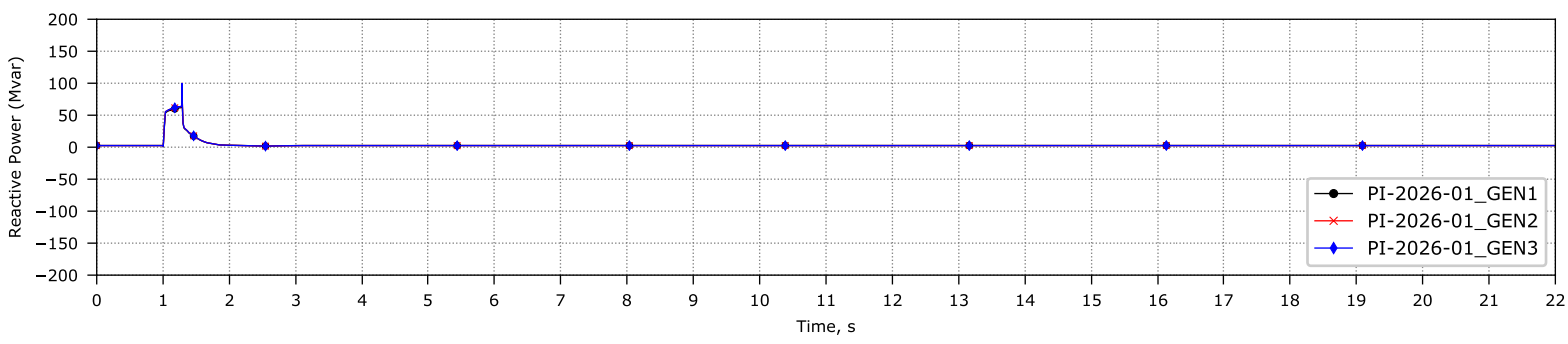
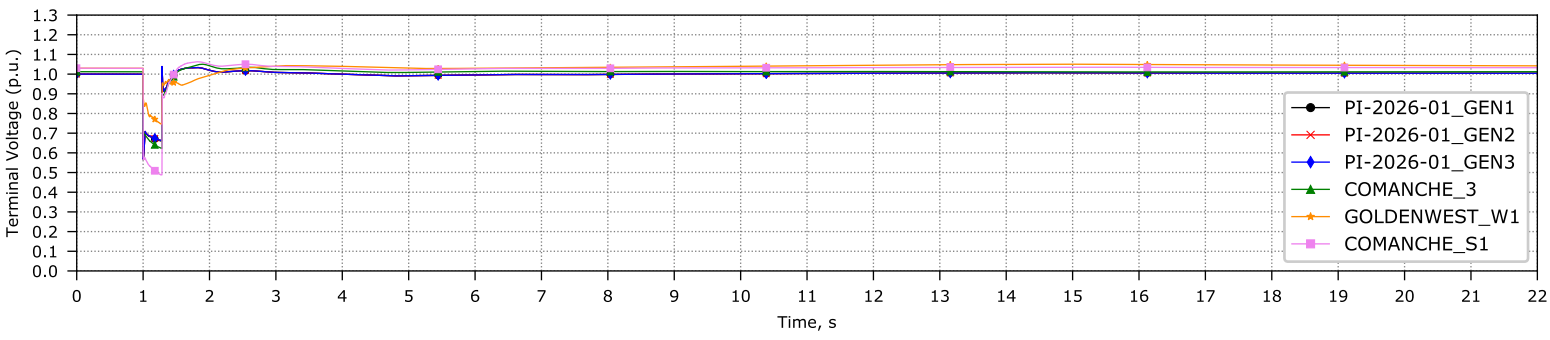

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

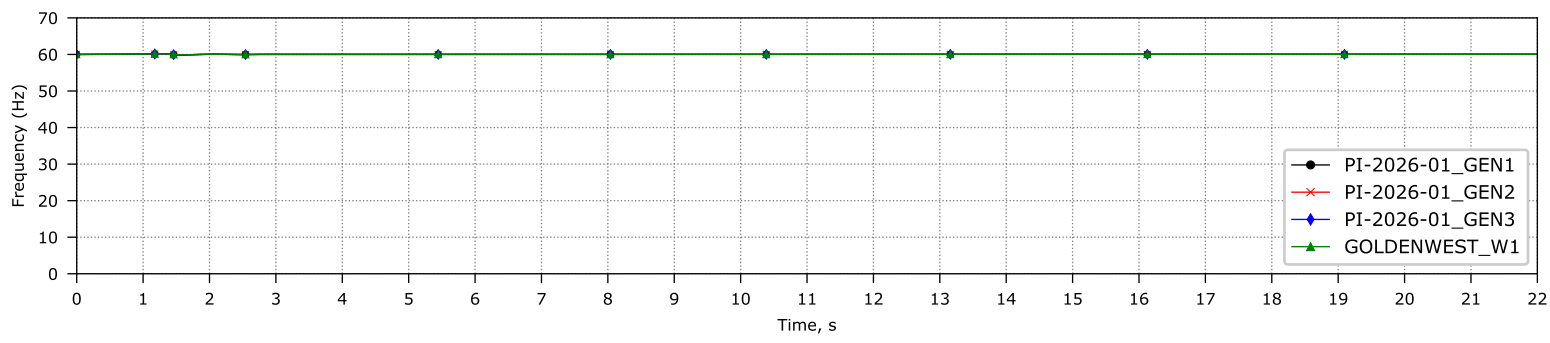

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

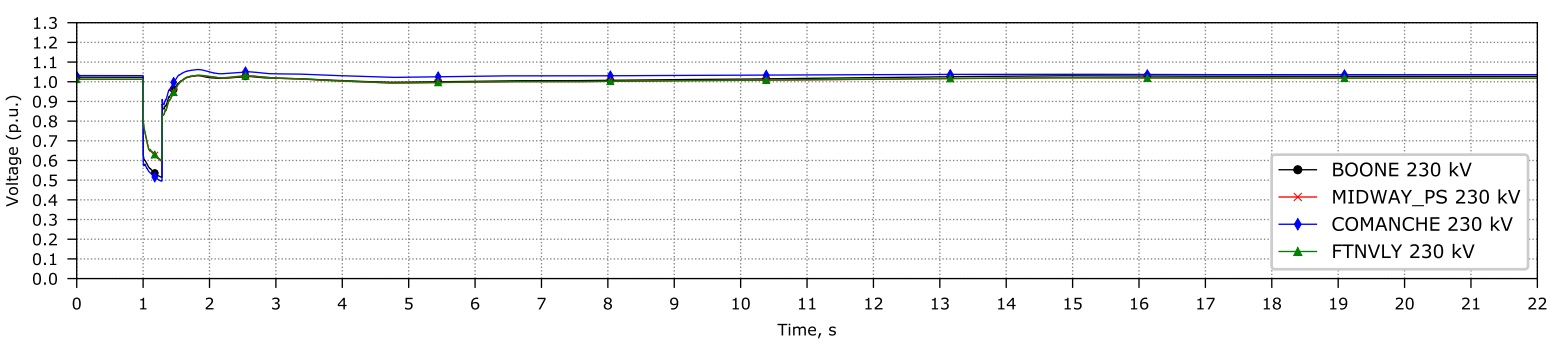

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

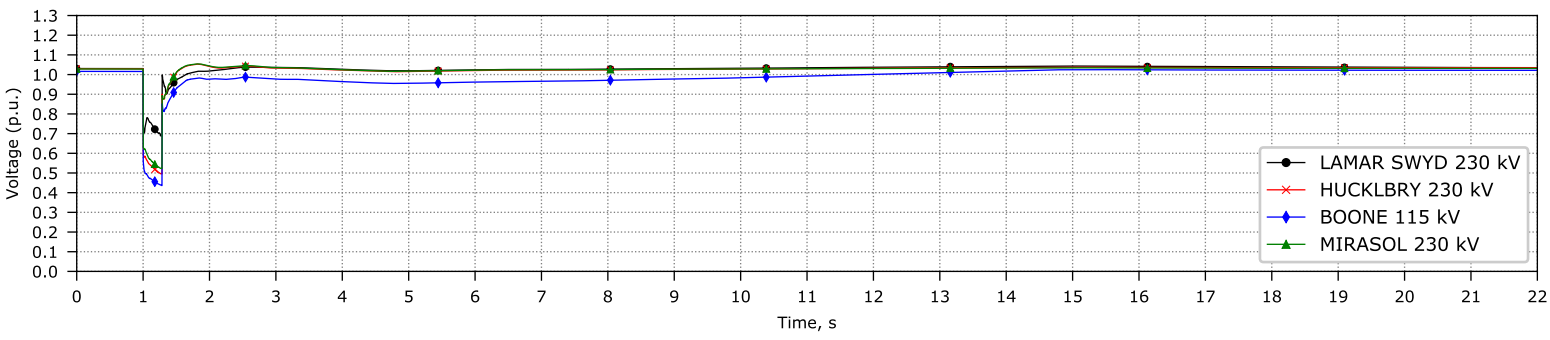

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1


Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1


Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV


Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV

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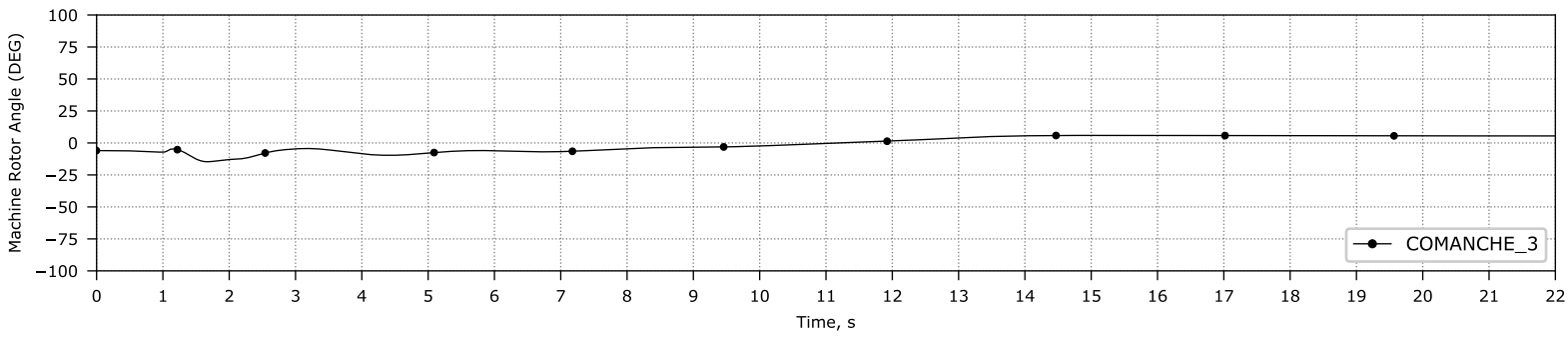
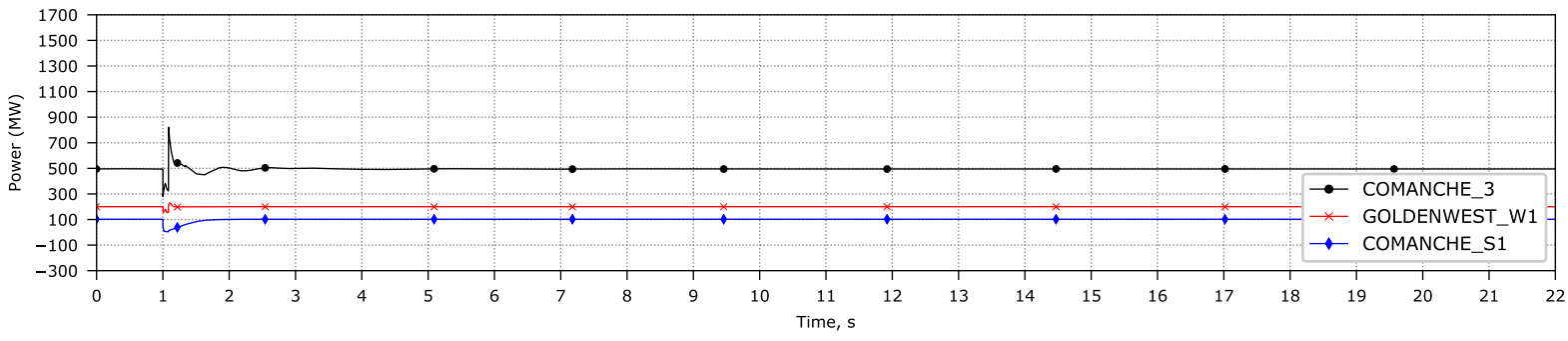
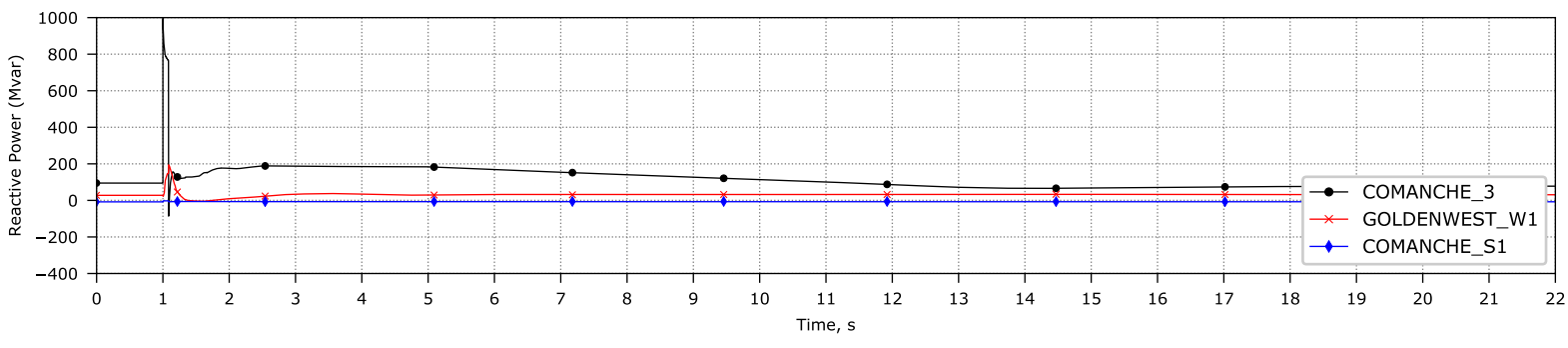
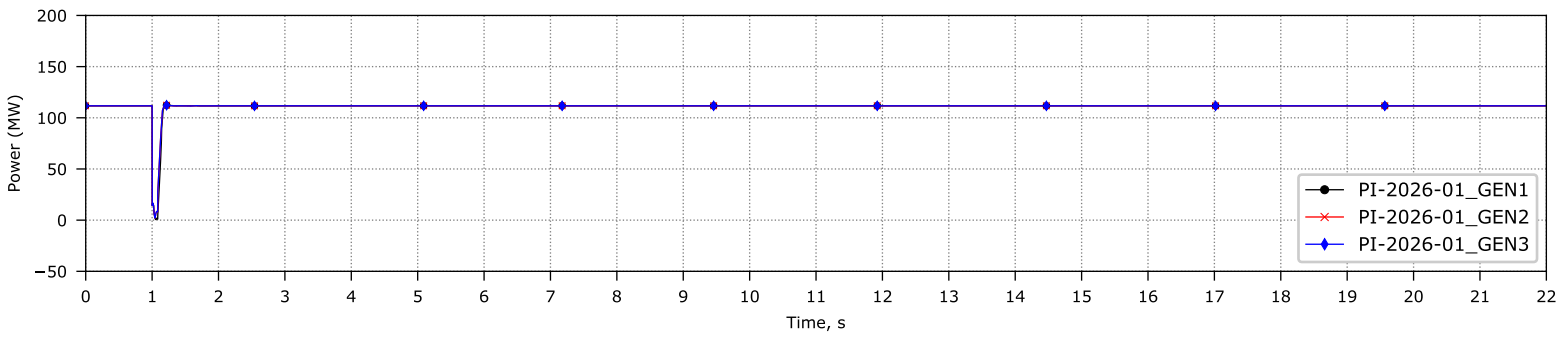
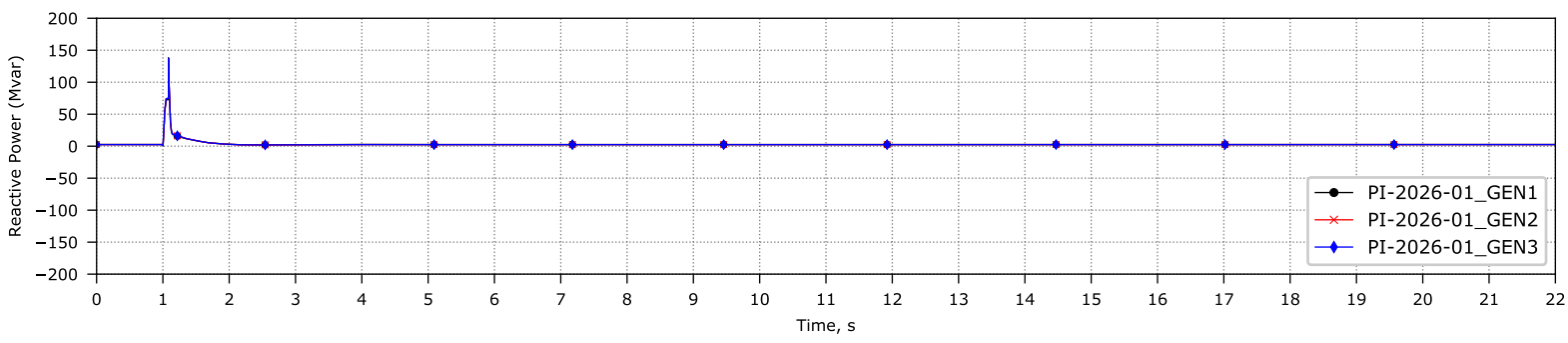
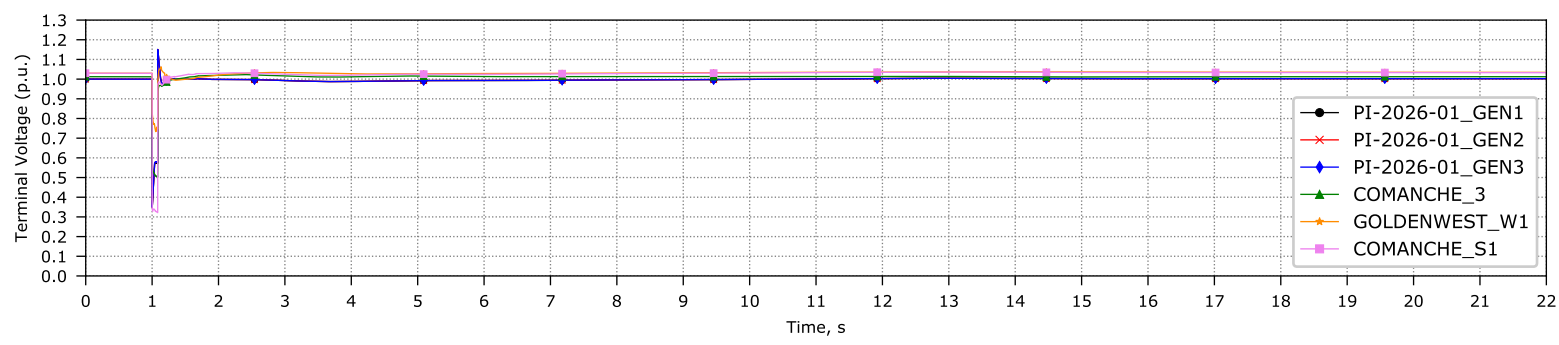

Machine Rotor Angle (DEG)
Time, s
COMANCHE_3

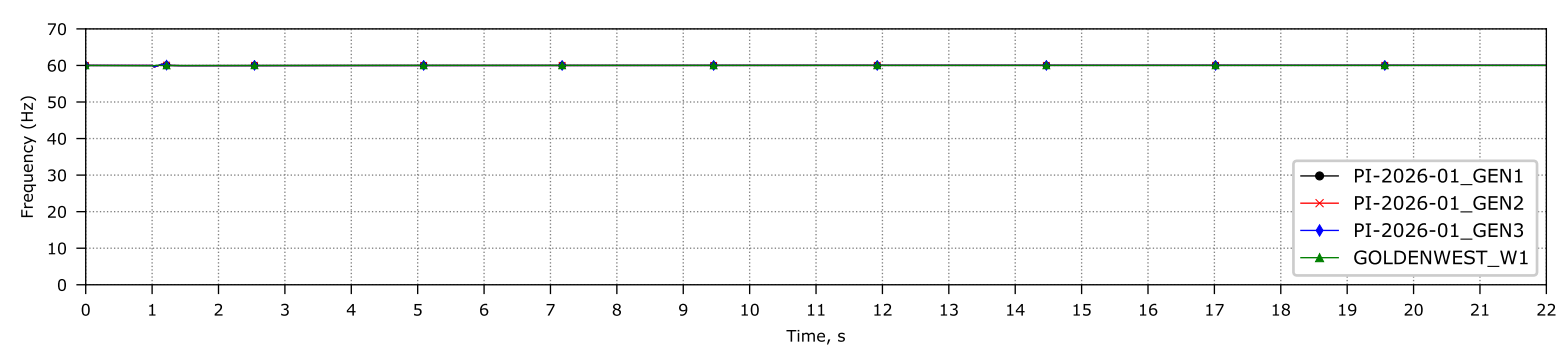

Power (MW)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

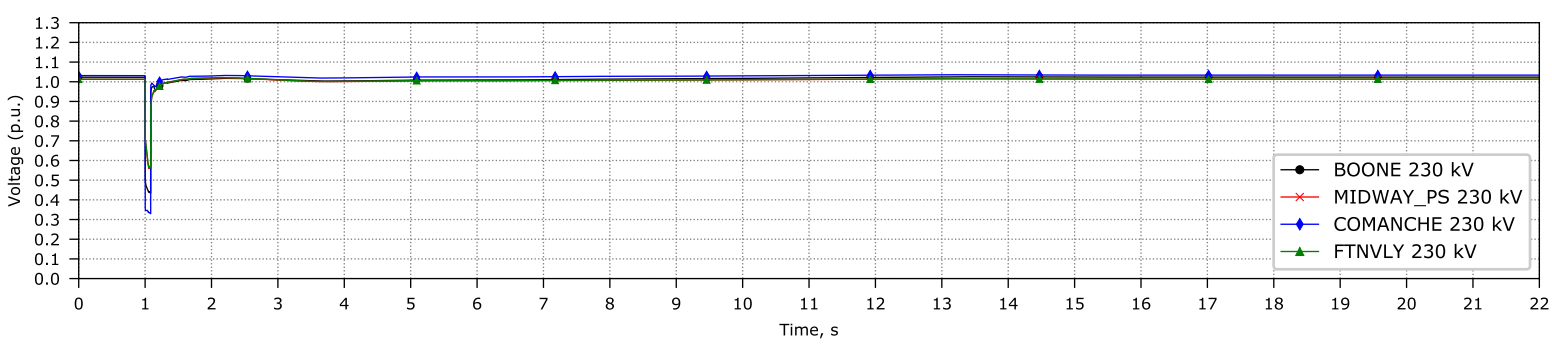

Reactive Power (Mvar)
Time, s
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1

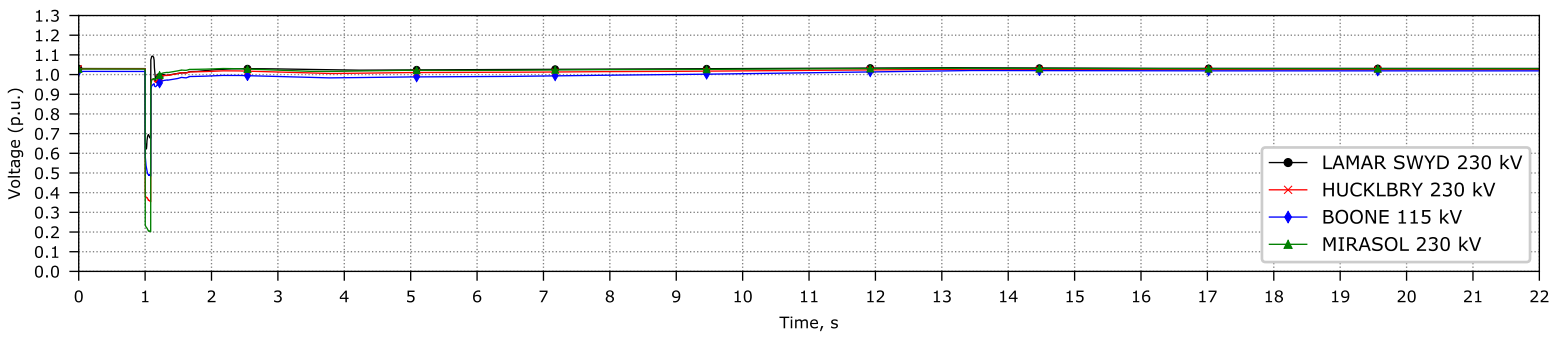

Power (MW)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Reactive Power (Mvar)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3


Terminal Voltage (p.u.)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
COMANCHE_3
GOLDENWEST_W1
COMANCHE_S1


Frequency (Hz)
Time, s
PI-2026-01_GEN1
PI-2026-01_GEN2
PI-2026-01_GEN3
GOLDENWEST_W1


Voltage (p.u.)
Time, s
BOONE 230 kV
MIDWAY_PS 230 kV
COMANCHE 230 kV
FTNVLY 230 kV


Voltage (p.u.)
Time, s
LAMAR SWYD 230 kV
HUCKLBRY 230 kV
BOONE 115 kV
MIRASOL 230 kV