Valley Electric Association, Inc.
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GridLiance West LLC
And
Valley Electric Association

Transmission Line Circuit Availability Performance Report

2026

Contents

A. INTRODUCTION 1
B. APPROACH TO AVAILABILITY PERFORMANCE ANALYSIS 1
C. PERFORMANCE INDICIATIONS 3
D. DISCUSSION OF RESULTS 4
E. SUMMARY OF OUTAGE DATA 6
F. CONTROL CHARTS 7

GridLiance West LLC and Valley Electric Association
Transmission Line Circuit Availability Performance Report

A. INTRODUCTION

The 2026 GridLiance West LLC (GLW) and Valley Electric Association (VEA) Transmission Line Circuit Availability Performance Report is developed to provide California Independent System Operator Corporation (CAISO) system availability performance measurements between January 1, 2025 and December 31, 2025. This report is submitted to comply with the maintenance reporting requirements outlined in the Transmission Control Agreement (TCA), California Public Utilities Code 348 and the CAISO Tariff.

VEA became a Participating Transmission Owner (PTO) in the CAISO on January 2nd, 2013. VEA owns and operates 138 kV voltage class transmission line. In 2017, VEA sold its 230 kV voltage class transmission lines to GLW, and GLW became a PTO in the CAISO. These transmission lines are under the CAISO operational control (Note: VEA's 138 kV transmission lines are classified under 115 kV voltage class per the TCA Appendix C defined voltage classes). Neither GLW nor VEA have complete historical transmission outage data prior to GLW or VEA becoming a PTO at CAISO. Collection of outage data for the purposes of Control Charts started from January 1, 2013.

B. APPROACH TO AVAILABILITY PERFORMANCE ANALYSIS

This report considers the performance of VEA's transmission circuits that are under the operational control of CAISO. VEA's forced outage data from its outage database was submitted to CAISO. These forced outage data was compared with VEA's forced outage information at CAISO (from CAISO's WebOMS system). The data validation was done in accordance with CAISO's Transmission Maintenance Procedure No 5. Transmission outages classified as "Not a Forced Outage" in the procedure are excluded. Moreover, VEA's forced outages that were de-energized for fire and other public safety reasons were also excluded. Transmission outages that last more than three days are capped at 72 hours so that excessively long forced outages do not skew the data. Forced outages in the database were rounded up to the nearest full minute.

The Availability performance of VEA is monitored using control charts. Annual performance indices reflecting annual Availability performance are then plotted on these control charts. The indices below are calculated using basic statistical methodology as outlined in section 4 of the TCA, Appendix C.

- Index 1: Annual Average Forced Outage (IMS) Frequency for All Transmission Line Circuits.
- Index 2: Annual Average Accumulated Forced Outage (IMS) Duration for those Transmission Line Circuits with Forced Outages (IMS).
- Index 3: Annual Proportion of Transmission Line Circuits with No Forced Outages (IMS).

Section 2.3.6 of CAISO Transmission Maintenance Procedure 2, dated 4/13/18, provides guidance on the outage data that should be included in calculating the control chart limits. In addition, the TMCC approved a change in 2014 to the valid Summary outage data used to

initially establish the control chart limits. As a result, the 2026 control charts were generated using forced outage data from 2013 to 2025, (13 years) regardless of any points triggered a test. This established the initial control chart limits. In addition, valid summary outage data from 2013 to present were included in the outage data for calculating the control chart limits provided the point didn't trigger a test. The control charts show 13 years of data, 2013 to 2025.

The statistical chart limits, which are upper and lower control limits (UCL and LCL, respectively) and upper and lower warning limits (UWL and LWL, respectively), are calculated either using so-called "bootstrap" resampling procedures (Indices 1 and 2) or using exact determinations of limits for the proportion chart (Index 3). The Center Control Line (CL) represents the average annual historical performance for a period prior to the current calendar year. The UCL and LCL define a range of expected performance extending above and below the CL. Collectively, the CL, UCL, LCL, UWL and LWL provide reference values for use in evaluating performance.

The four tests have been selected to enable identification of exceptional performance in an individual calendar year, shifts in longer-term performance, and trends in longer-term performance.

Test 1 Control Limit Test: The index value for the current calendar year falls outside the UCL (Upper Control Limit) or LCL (Lower Control Limit).

Test 2 Center Line Test: At least v1 consecutive annual index values fall above the CL (Center Line) or v2 consecutive annual index values fall below the CL. The actual values of v1 and v2 will be outputted from the bootstrap resampling procedures. The choices for v1 and v2 are designed to keep the probability of these events less than one percent. (Refer to Table 1 of Appendix C of the TCA for values of v1 and v2).

Test 3 Warning Limit Test: At least two out of three consecutive annual index values fall outside the UWL or LWL on the same side of the CL.

Test 4 Trend Test: Six or more values are consecutively increasing or consecutively decreasing.

Therefore, Test 1 is designed to detect a short-term change or jump in the average level. Tests 2 and 4 are looking for long-term changes. Test 2 will detect a shift up in averages or a shift to a lower level. Test 4 is designed to detect either a trend of continuous increase in the average values or continuous decrease. Test 3 is designed to assess changes in performance during an intermediate period of three calendar years. If Test 3 is satisfied, the evidence is of a decline (or increase) in Availability over a three-calendar year period.

The four tests will assist the CAISO and VEA in assessing the Availability performance of the transmission system for each voltage class.

C. PERFORMANCE INDICIATIONS

Performance Indications provided by control charts were tested. Four tests have been selected to enable identification of exceptional performance in an individual year, shifts in long term performance, and trends in longer-term performance. The four (4) tests were applied to the three (3) indices for each voltage class and the results are as follows:

115 kV Voltage Class

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
115 kV Annual Forced Outage Frequency	1	value is above the UCL			Test Not Triggered
		value is below the LCL when LCL>0			
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
115 kV Annual Forced Outage Duration	1	value is above the UCL			Test Not Triggered
		value is below the LCL when LCL>0			
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
115 kV Annual Proportion of Transmission Line Circuits with NO Forced Outages	1	value is above the UCL			Test Not Triggered
		value is below the LCL when LCL>0			
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

230 kV Voltage Class

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
230 kV Annual Forced Outage Frequency	1	value is above the UCL			Test Not Triggered
		value is below the LCL when LCL>0			
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
230 kV Annual Forced Outage Duration	1	value is above the UCL			Test Triggered
		value is below the LCL when LCL>0	X		
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

Control Chart Type	Test		Performance Status Indicated by Test Results		
	Number	Results	Improvement	Degradation	Comment
230 kV Annual Proportion of Transmission Line Circuits with NO Forced Outages	1	value is above the UCL	X		Test Triggered
		value is below the LCL when LCL>0			
	2	v1 or more consecutive values above the CL			Test Not Triggered
		v2 or more consecutive values below the CL			
	3	2 out of 3 values above the UWL			Test Not Triggered
		2 out of 3 values below the LWL			
	4	6 consecutive values increasing			Test Not Triggered
		6 consecutive values decreasing			

D. DISCUSSION OF RESULTS

115 kV System

The 115kV voltage class no tests triggered

230 kV System

The 230kV voltage class triggered two (2) test due to no forced outage occurring in 2025 which is an improvement from the prior six consecutive years. A major contributor to this improvement is updates , adherence, and enforcement of outage scheduling policy and practices.

Control Chart Performance Metrics

Voltage Class	Test	Control Limit		Center Limit	Warning Limit	
		Upper	Lower		Upper	Lower
115 KV	Frequency	0.842	0.000	0.299	0.667	0.000
	Duration	9315.5	0.000	955.53	8319.75	1.000
	Proportion	0.995	0.340	0.764	0.947	0.340
230 KV	Frequency	0.683	0.000	0.171	0.500	0.000
	Duration	469.0	40	150.0	438.4	7.4
	Proportion	0.999	0.187	0.816	0.986	0.364

E. SUMMARY OF OUTAGE DATA

115 kV Voltage Class

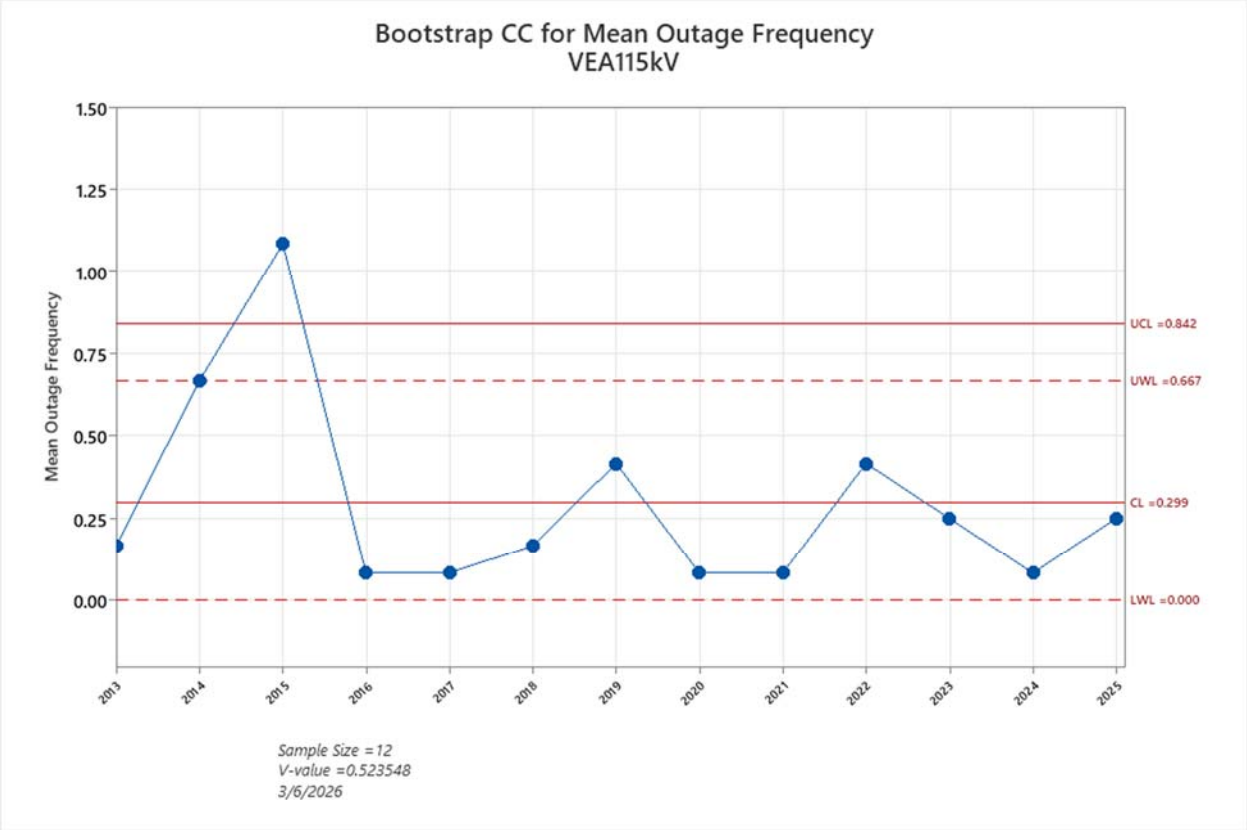
Transmission Owner	Transmission Line ID	Voltage Class	Year	Annual Outage Frequency	Annual Outage Duration Minutes
VEA	AMARGOSA-SANDY	115	2025	2	245
VEA	CHARLESTON-THOUSANDAIRE	115	2025	0	0
VEA	GAMEBIRD-PAHRUMP	115	2025	0	0
VEA	GAMEBIRD-SANDY	115	2025	0	0
VEA	GAMEBIRD-THOUSANDAIRE	115	2025	0	0
VEA	LATHROP-BEATTY	115	2025	0	0
VEA	LATHROP-JACKASS FLATS	115	2025	0	0
VEA	LATHROP-VALLEY SWITCH	115	2025	0	0
VEA	PAHRUMP-VISTA	115	2025	1	9
VEA	VALLEY SWITCH-VALLEY	115	2025	0	0
VEA	VISTA-VALLEY SWITCH	115	2025	0	0
VEA	INNOVATION-MERCURY SWITCH	115	2025	0	0
			Totals	**3**	**254**

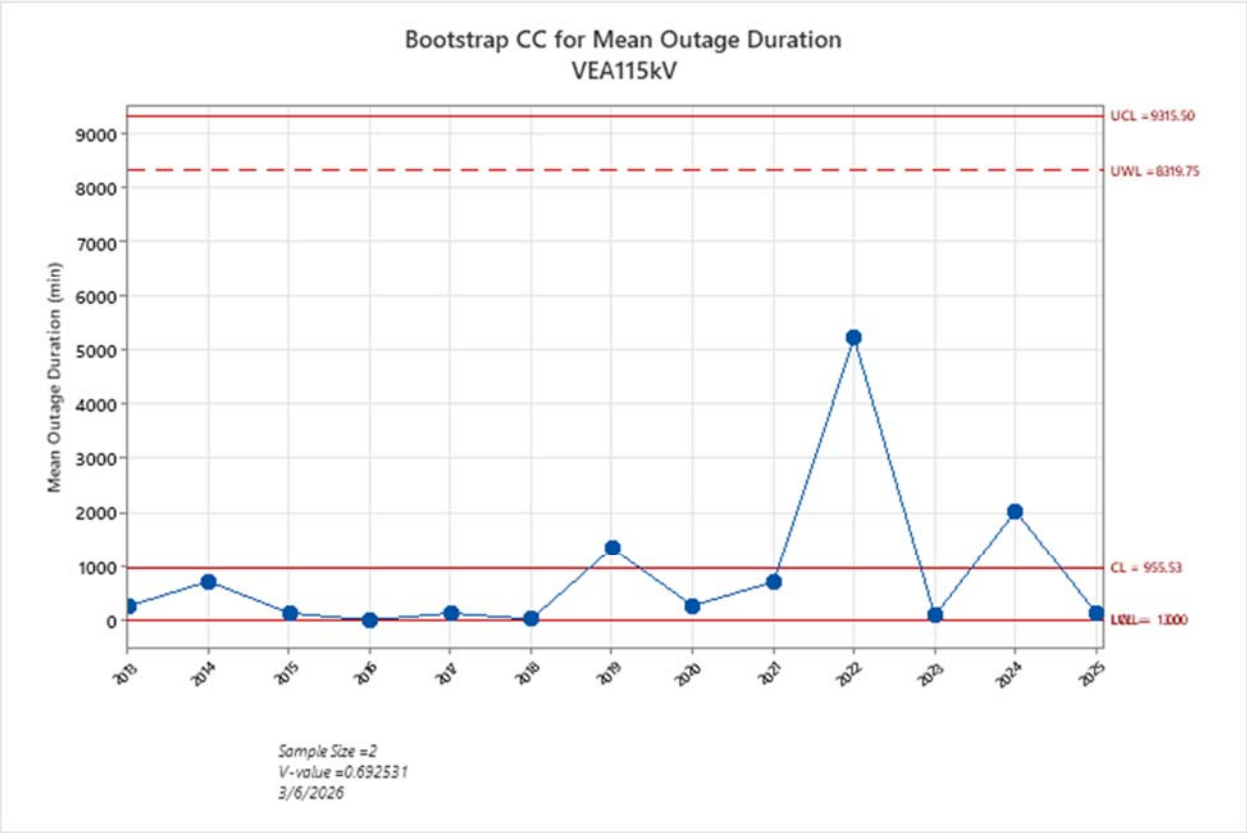
230 kV Voltage Class

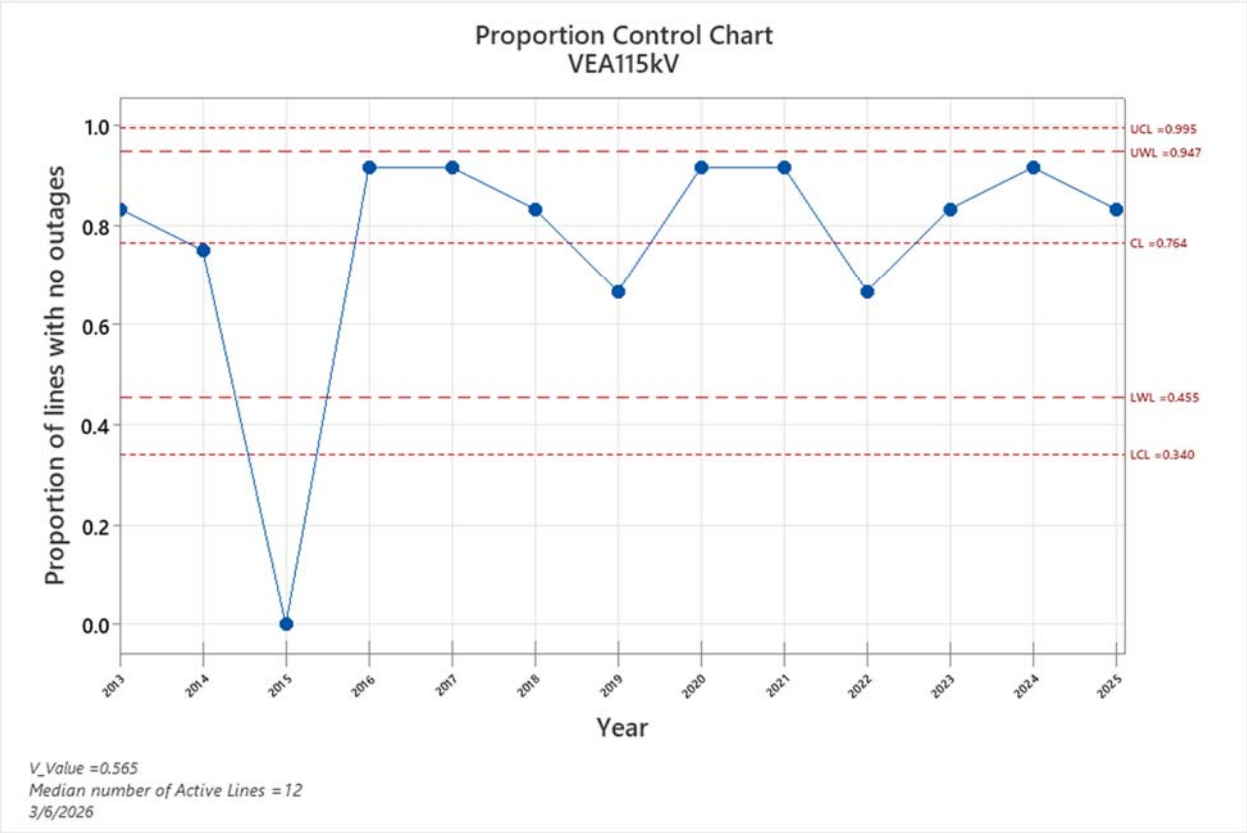
Transmission Owner	Transmission Line ID	Voltage Class	Year	Annual Outage Frequency	Annual Outage Duration Minutes
GLW	DESERT VIEW-NORTHWEST	230	2025	0	0
GLW	DESERT VIEW-INNOVATION	230	2025	0	0
GLW	INNOVATION-PAHRUMP	230	2025	0	0
GLW	PAHRUMP-GAMEBIRD	230	2025	0	0
GLW	GAMEBIRD-TROUT CANYON	230	2025	0	0
GLW	TROUT CANYON-SLOAN CANYON	230	2025	0	0
GLW	SLOAN CANYON-ELDORADO	230	2025	0	0
GLW	SLOAN CANYON-MEAD	230	2025	0	0
GLW	PAHRUMP-MEAD	230	2025	0	0
			Totals	**0**	**0**

F. CONTROL CHARTS

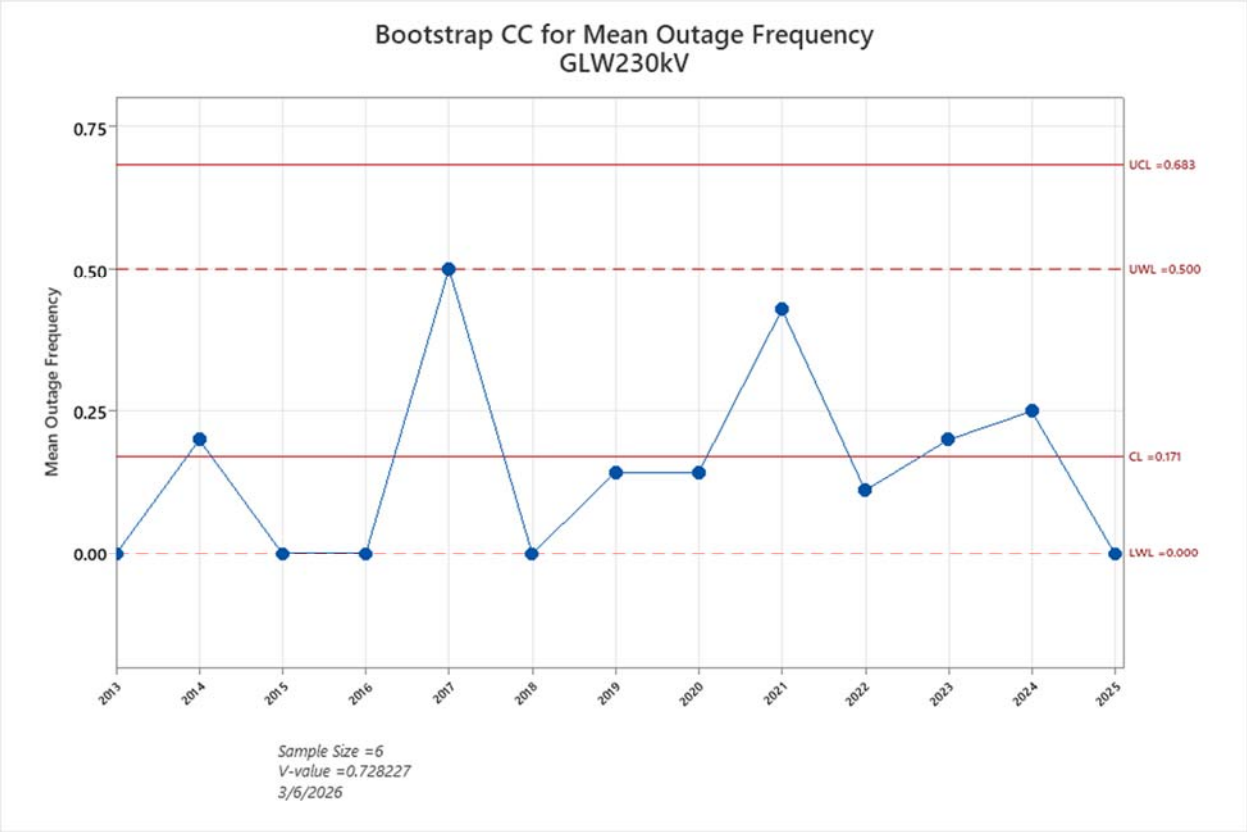
115 kV Charts

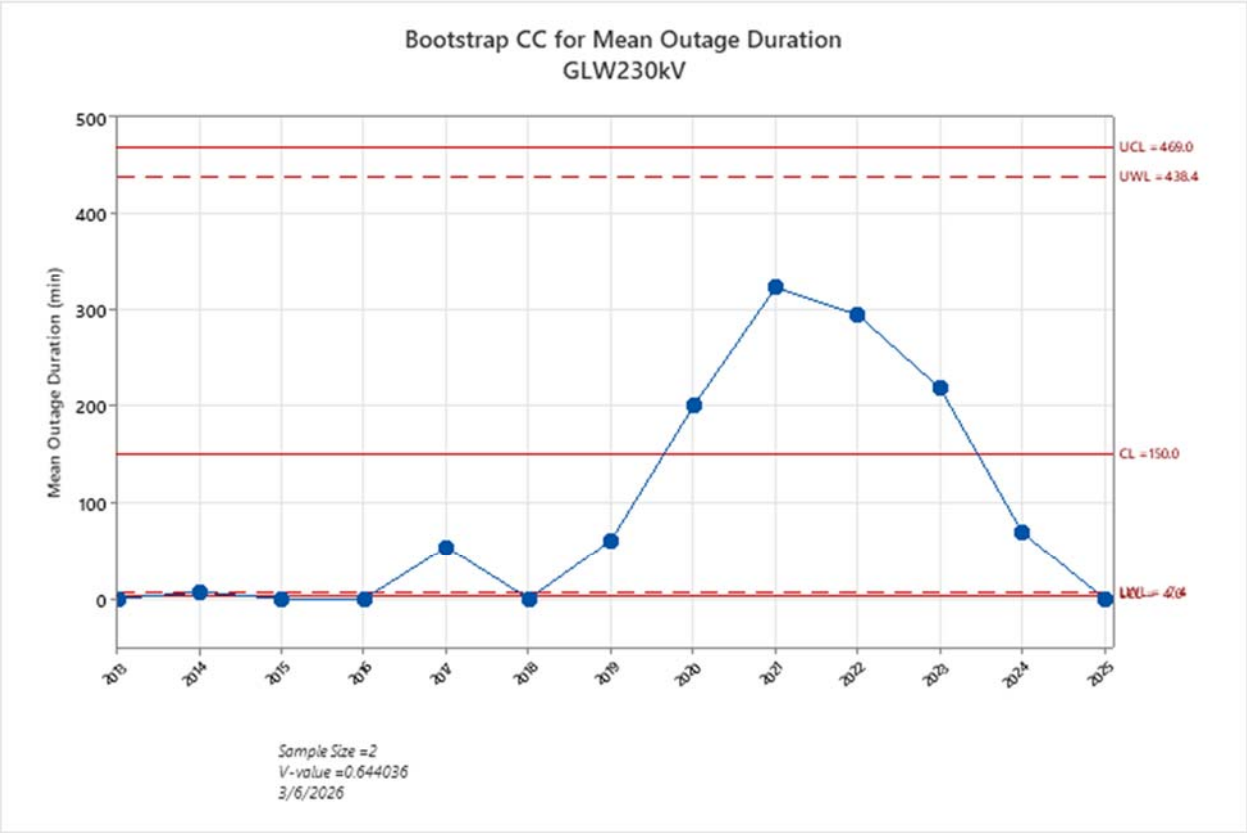


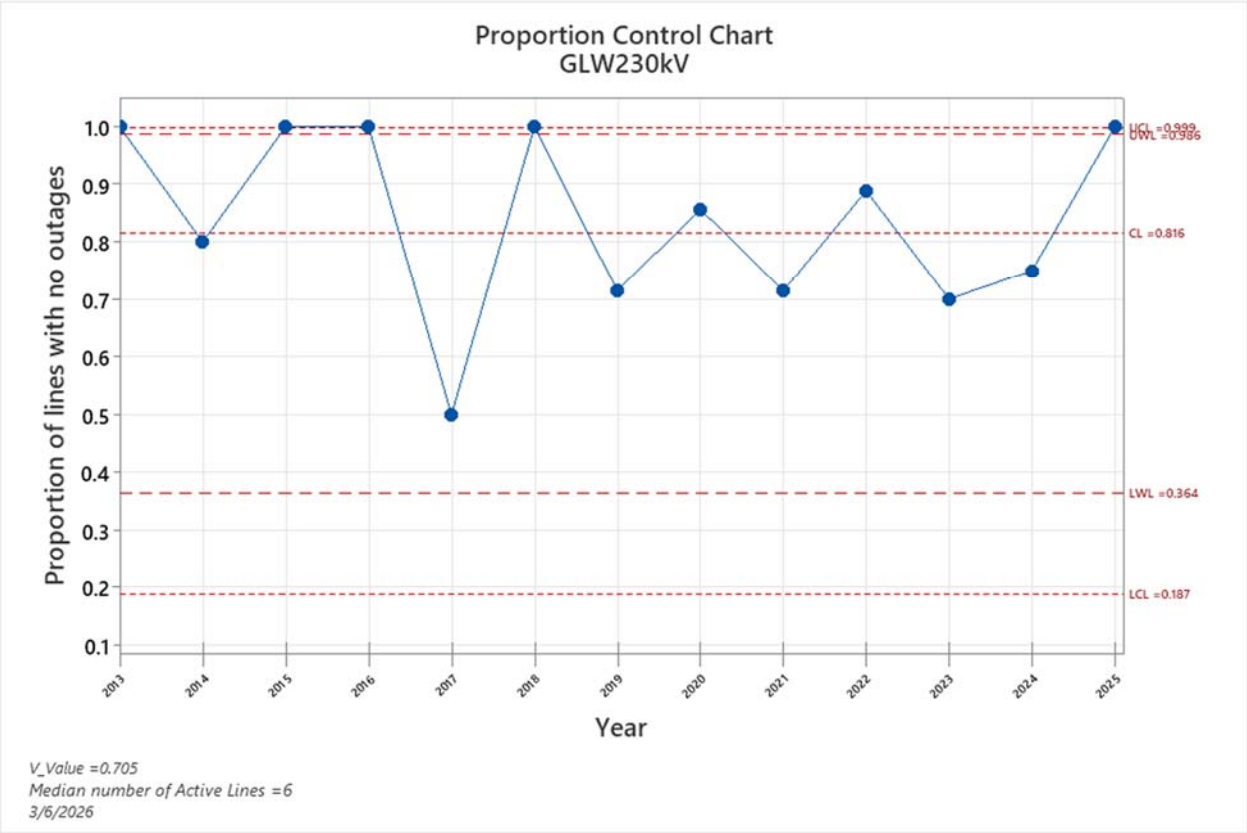

Bootstrap CC for Mean Outage Duration
VEA115kV
Mean Outage Duration (min)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
UCL = 9315.50
UWL = 8319.75
CL = 955.53
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Sample Size = 2
V-value = 0.692531
3/6/2026


Proportion Control Chart
VEA115kV
Proportion of lines with no outages
1.0
0.8
0.6
0.4
0.2
0.0
UCL =0.995
UWL =0.947
CL =0.764
LWL =0.455
LCL =0.340
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year
V_Value =0.565
Median number of Active Lines =12
3/6/2026

230 kV Charts




Bootstrap CC for Mean Outage Duration
GLW230kV
Mean Outage Duration (min)
500
400
300
200
100
0
UCL = 469.0
UWL = 438.4
CL = 150.0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Sample Size =2
V-value =0.644036
3/6/2026


Proportion Control Chart
GLW230kV
Proportion of lines with no outages
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
UCL =0.999
UWL =0.985
CL =0.816
LWL =0.364
LCL =0.187
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year
V_Value =0.705
Median number of Active Lines =6
3/6/2026