

MISO Affected System Impact Study For SPP DISIS-2017-001 Projects Restudy – Addendum Report R3

July 25, 2022

MISO 720 City Center Drive Carmel Indiana - 46032 http://www.misoenergy.org



Revision History

Date	Rev.	Description
September 2021	0	MISO AFS DISIS-2017-001 Phase III Report
March 2022	1	MISO AFS DISIS-2017-001 Restudy Addendum Report GEN-2017-013 Withdrawal
May 2022	2	OTP Upgrade not required (Invalid Contingency)
July 2022	3	MISO AFS DISIS-2017-001 Restudy Addendum Report GEN-2017-032 Withdrawal



TABLE OF CONTENTS

1. Bac	kground	.4	
2. Exe	ecutive Summary	.4	
2.1.	Study Project	.5	
3. Mo	del Updates	.5	
3.1.	Model Development	.5	
4. Stea	ady State Analysis	.6	
4.1.	Thermal Results	.6	
4.2.	Voltage Results	.6	
4.3.	Network Upgrades	.6	
5. Cos	st Allocation	.6	
6. Cor	clusion	.7	
Appendi	x A - Voltage Results	. 8	
Appendi	Appendix B - Cost Allocation		



LIST OF TABLES

Table 2-1 Cost Allocation Summary	5
Table 2-2 DISIS-2017-001 Study projects	5
Table 2-3 DISIS-2017-001 Withdrawn project(s)	5
Table 4-1 Network Upgrades	6
Table 5-1 Network Upgrade Cost Allocation	6

1. Background

Midcontinent Independent System Operator ("MISO") performed Affected System studies ("AFS") for the interconnection requests in the Southwest Power Pool ("SPP") Definitive Interconnection System Impact Studies ("DISIS") DISIS-2017-001. The MISO provided Affected System Study results and report for DISIS-2017-001 Phase II and Phase III. DISIS-2017-001 Phase III report was provided in September 2021.

MISO AFS in Phase II was divided into two groups to identify impacts on the MISO-West and MISO-South regions. No adverse impacts were identified in MISO-South region; hence no network upgrades were identified in MISO-South region. Several adverse impacts were observed in MISO-West region in Phase II and network upgrades were identified.

In Phase III, Studies for MISO-West region for performed, incorporating withdrawals at the Decision Point 2 in SPP Interconnection process. Criteria violations were observed in Summer-Shoulder scenario and network upgrades were identified to mitigate the constraints. Phase III report was provided to SPP in September 2021. MISO-South region Phase III AFS study was not performed.

It was noted that two study projects that were assigned network upgrades, GEN-2017-013 and GEN-2017-032 withdrew from SPP Interconnection queue. A restudy was performed to assess the impacts of GEN-2017-013 and GEN-2017-032 withdrawal.

This addendum report updates the findings of the Phase III report entitled as "Final Report MISO Affected System Studies for SPP DISIS-2017-001 Projects Restudy – Addendum Report R3" and shall supersede the findings of previously provided MISO AFS DISIS-2017-001 reports.

2. Executive Summary

Results have been updated to reflect Network upgrade requirements after the withdrawal of study unit(s) GEN-2017-013 and GEN-2017-032.

In Phase III study, criteria violations were observed only in Steady-state Shoulder Peak Scenario for West region projects. Only projects that were dispatched in West region models in Shoulder Peak Case were studied. Solar projects are not dispatched in Shoulder Peak Scenario as per MISO's fuel-type dispatch and were not studied.

No stability issues were identified in Phase III studies, Stability studies were not part of this restudy.

Summary of cost allocation (cost responsibility of each of the study projects) of network upgrades is provided in Table 2-1

Project	Total	
GEN-2017-004	\$3,630,331	
GEN-2017-010	\$6,206,898	
GEN-2017-014	\$9,607,078	
GEN-2017-048	\$9,567,271	
GEN-2017-094	\$6,988,422	
Total	\$36,000,000	

Table 2-1 Cost Allocation Summary

2.1. Study Project(s)

SPP DISIS-2017-001 study projects as part of this restudy in MISO-West region are listed in Table 1-1 below.

Project	Fuel	Shoulder Pgen (MW) Point of Interconnection		State
GEN-2017-004	Wind	201.6	Elm Creek - Summit 345 kV	KS
GEN-2017-010	Wind	200.1 Rhame 230 kV Sub		ND
GEN-2017-014	Wind	300	Underwood - Philip Tap 230 kV	SD
GEN-2017-048	Wind	300 Neset 230 kV Substation		ND
GEN-2017-094	Wind	200	Fort Thompson-Huron 230 kV	SD

 Table 2-2 DISIS-2017-001 Study projects

Withdrawn study projects are mentioned in Table 2-3

Table 2-3 DISIS-2017-001	Withdrawn project(s)

Project	Fuel	Shoulder Pgen (MW)	Point of Interconnection	
GEN-2017-013	Wind	200	Mingo 345kV	KS
GEN-2017-032	Wind	200	Finney - Lamar 345 kV	CO

Steady state thermal and steady state voltage analyses were performed to identify any reliability criteria violations caused by the study projects.

3. Model Updates

3.1. Model Development

MISO AFS DISIS-2017-001 Phase III Summer Shoulder models were used as base for this study. Study models were updated to reflect the withdrawal of study projects mentioned in Table 2-3.

DPP-2017-Feb Phase 3 study cases were used to develop models for DISIS-2017-001 study, these cases are based on the MISO Transmission Expansion Planning ("MTEP") cases from 2018, built for 2023.

4. Steady State Analysis

4.1. Thermal Results

No thermal violations were identified as impacted by the DISIS-2017-001 study projects in the shoulder case.

4.2. Voltage Results

Voltage criteria violations were observed in the shoulder case. Low Voltage violations were observed MEC (635). MISO shared the results with the affected Transmission Owners and received their inputs on potential mitigations and validity of results. A detailed list of violations that require mitigations is provided in Appendix A.

4.3. Network Upgrades

Three network upgrades were identified to address the voltage violations based on the feedback from the transmission owners.

NU#	Description	Planning Level Cost Estimate (\$M)	Area number	Area Name
1	100 MVAR Capacitor Bank at Montezuma 345 kV	6.0	635	MEC
2	100 MVAR SVC/Statcom at Blackhawk 345 kV	30.0	635	MEC

5. Cost Allocation

Cost of the network upgrades mentioned in Table 4-1 is allocated to study projects in accordance with MISO Business Practices. Table 5-1 shows the cost responsibility for each of the study projects.

Project	Network upgrade 1	Network upgrade 2	Total
GEN-2017-004	\$989,247	\$2,641,083.52	\$3,630,331
GEN-2017-010	\$924,731	\$5,282,167.04	\$6,206,898
GEN-2017-014	\$1,548,387	\$8,058,690.74	\$9,607,078
GEN-2017-048	\$1,440,860	\$8,126,410.84	\$9,567,271
GEN-2017-094	\$1,096,774	\$5,891,647.86	\$6,988,422
Total	\$6,000,000	\$30,000,000.00	\$36,000,000

Table 5-1 Network Upgrade Cost Allocation

6. Conclusion

Due to withdrawal of MISO AFS DISIS-2017-001 study projects GEN-2017-013 and GEN-2017-032, MISO preformed restudy to see impacts of remaining projects in DISIS-2017-001 cycle on MISO footprint. The results of previously performed Phase III study were adjusted and updated cost allocation responsibilities are provided to DISIS-2017-001 study projects.

Appendix A - Voltage Results

Appendix B - Cost Allocation