FEASIBILITY CLUSTER STUDY FOR GENERATOR INTERCONNECTION REQUESTS

FCS-2018-004

Published on 3/4/2019

By SPP Generator Interconnections Dept.

1 REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION	COMMENTS
02/23/2019	SPP	Report Issued (FCS-2018-004).	
3/4/2019	SPP	Added Primary and Secondary POIs for GEN-2018-075 that were previously deemed invalid.	
3/5/2019	SPP	Updated the interconnection cost for GEN-2018-075 Primary	

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2 INTRODUCTION

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Feasibility Cluster Study (FCS) for generation interconnection requests received during the FCS Queue Cluster Window, which closed on November 25, 2018. The customers will be referred to in this study as the FCS Interconnection Customers. The FCS analyzes the impact of interconnecting new generation totaling 1,070.0 MW to the SPP Transmission System. The interconnecting SPP Transmission Owners include:

- Nebraska Public Power District (NPPD)
- Southwestern Public Service Company (SPS)
- Oklahoma Gas & Electric Company (OKG&E)

The primary objective of this Feasibility Cluster Study is to identify the system constraints associated with connecting the generation to the area transmission system. The Feasibility and other subsequent Interconnection Studies are designed to identify attachment facilities, Network Upgrades and other Direct Assignment Facilities needed to accept power into the grid at each specific interconnection receipt point.

Table 2-1: Point of Interconnections Requested and Studied

Interconnection Request	Fuel Type	Max Output (MW)	Service	Group	Point of Interconnection (POI) Requested	Point of Interconnection (POI) Studied	SPP Comments
GEN-2018-066	Solar / Battery	400	ER / NR	9	Gerald Gentlemen 345 kV	(P) Gerald Gentlemen 345 kV	Highly dependent on higher queued interconnection requests; would require multi-million dollar facility study and interconnection upgrades
GEN-2018-075	CT	204 SP / 230 WP	ER Only	6	Bopco 345 kV	(P) Bopco 345 kV	
					Bopco 115 kV	(S) Bopco 115 kV	
					Kiowa 345 kV	(T) Kiowa 345 kV	
GEN-2018-078	Wind	240	ER/NR	6	Tap Eddy Co – Crossroads 345 kV	(P) Tap Eddy Co – Crossroads 345 kV	
GEN-2018-127	Solar	200	ER/NR	8	Cresent 138 kV	(P) Cresent 138 kV	
					Cresent – Twin Lakes 138 kV (too close to Cresent substation)	N/A	Invalid POI; tap requested too close to an existing substation
					Cresent – Cottonwood 138 kV (too close to Cresent substation)	N/A	Invalid POI; tap requested too close to an existing substation

A First Contingency Incremental Transfer Capability (FCITC) analysis was performed for each Scenario outlined in **Table 2-2**.

Table 2-2: Scenario Descriptions

Scenario	Interconnection Request(s)	Scenario Description	Point of Interconnection (POI) Studied
Scenario 1	GEN-2018-066	Group 09 ERIS & Group 09 NRIS	(P) Gerald Gentlemen 345 kV
Scenario 2	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(T) Kiowa 345 kV
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV
Scenario 3	GEN-2018-127	Group 08 ERIS & Group 08 NRIS	(P) Cresent 138 kV
Scenario 4	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(P) Bopco 345 kV
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV
Scenario 5	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(S) Bopco 115 kV
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV

Please note that since the DISIS-2017-001, DISIS-2017-002, DISIS-2018-001, and DISIS-2018-002 have not been completed, only higher queued requests and upgrades through DISIS-2016-002 were included in this analysis.

Network upgrades assigned to higher queued interconnection requests may become the cost responsibility of lower queued interconnection requests if the higher queued request withdraws and a restudy deems the network upgrade necessary for the lower queued request.

3 MODEL DEVELOPMENT

3.1 UPGRADES INCLUDED IN THE ANALYSIS

3.1.1 BASE CASE UPGRADES

The facilities listed **Appendix A** in are part of the current SPP Transmission Expansion Plan, the Balanced Portfolio, or recently approved Priority Projects. These facilities have an approved Notification to Construct (NTC) or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The Feasibility Interconnection Customers have not been assigned advancement costs for the projects listed below.

The FCS Interconnection Customers' Generation Facilities in-service dates may need to be delayed until the completion of the following upgrades. In some cases, the in-service date is beyond the allowable time a customer can delay. If the requests proceed forward into the DISIS, the Interconnection Customer may move forward with Limited Operation or remain in the DISIS Queue for additional study cycles. If, for some reason, construction on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the Interconnection Customers during the DISIS.

3.1.2 CONTINGENT UPGRADES

The facilities in **Appendix B** do not yet have approval. These facilities have been assigned to higher-queued interconnection customers. These facilities have been included in the models for this study and are assumed to be in service. This list may not be all-inclusive. The FCS Interconnection Customers, at this time, do not have cost responsibility for these facilities but may later be assigned cost if higher-queued customers terminate their Generation Interconnection Agreement or withdraw from the interconnection queue. The FCS Interconnection Customer Generation Facilities in-service dates may need to be delayed until the completion of the following upgrades.

3.1.3 POTENTIAL UPGRADES NOT IN THE BASE CASE

Any potential upgrades that do not have a Notification to Construct (NTC) and are not explicitly listed within this report have not been included in the base case. These upgrades include any identified in the SPP Extra-High Voltage (EHV) overlay plan, or any other SPP planning study other than the upgrades listed above in the previous section.

3.2 HIGHER QUEUED REQUESTS INCLUDED IN THE ANALYSIS

3.2.1 SPP REQUESTS

Appendix C outlines the higher queued SPP requests included in this analysis. These requests have higher queue priority to the FCS-2018-004 requests. Please note that DISIS-2017-001 through DISIS-2018-004 requests have been excluded from this analysis because the impact studies have not been completed.

3.2.2 MISO REQUESTS

Appendix D outlines the higher queued MISO requests included in the analysis. MISO requests are designated a group number based on electrical and geographic proximity to other SPP requests.

3.2.3 CURRENT STUDY SPP REQUESTS

Please refer to **Table 2-1** for an overview of the projects under study and the associated Point of Interconnection(s) requested. **Table 2-2** outlines the various FCITC scenarios conducted for this Feasibility study.

3.3 POWER FLOW

The power flow models used for this study are based on the 2016-series Integrated Transmission Planning models used for the 2017 ITP-Near Term analysis. These models include:

- Year 1 2017 winter peak (17WP)
- Year 2 2018 spring (18G)
- Year 2 2018 summer peak (18SP)
- Year 5 2021 summer (21SP)
- Year 5 2021 light (21L)
- Year 5 2021 winter peak (21WP)
- Year 10 2026 summer peak (26SP)

3.4 DISPATCH OF INTERCONNECTION REQUESTS

3.4.1 SPP INTERCONNECTION REQUESTS

Please refer to **Table 3-1** for an overview of SPP dispatch criteria.

Table 3-1: SPP GIR Power Flow Fuel Type Dispatch

Dispatch Type	Season	Service Type	Renewable (in group)	Renewable (out of group)	Conventional (in group)	Conventional (out of group)
ERIS HVER	All	All	100%	20%	N/A	N/A
ERIS LVER	Peak	All	20%	20%	100%	100%
NRIS HVER	Spring and Light Load	ERIS	80%	20%	N/A	N/A
		NRIS	100%	20%	100%	20%
NRIS LVER	Peak	ERIS	20%*	20%*	80%	80%
		NRIS	100%	100%	100%	100%

For Variable Energy Resources (VER) (solar/wind) in each power flow case, Energy Resource Interconnection Service (ERIS), is evaluated for the generating plants within a geographical area of the interconnection request(s) for the VERs dispatched at 100% nameplate of maximum generation. The VERs in the remote areas are dispatched at 20% nameplate of maximum generation. These projects are dispatched across the SPP footprint using load factor ratios.

Peaking units are not dispatched in the spring case, or in the "High VER" summer and winter peak cases. To study peaking units' impacts, the Year 1 winter peak and Year 2 summer peak, Year 5 summer and winter peaks, and Year 10 summer peak models are developed with peaking units dispatched at 100% of the nameplate rating and VERs dispatched at 20% of the nameplate rating. Each interconnection request is also modeled separately at 100% nameplate for certain analyses.

All generators (VER and peaking) that requested Network Resource Interconnection Service (NRIS) are dispatched in an additional analysis into the interconnecting Transmission Owner's (T.O.) area at 100% nameplate with Energy Resource Interconnection Service (ERIS) only requests at 80% nameplate. This method allows for identification of network constraints that are common between regional groupings to have affecting requests share the mitigating upgrade costs throughout the cluster.

3.4.2 MISO INTERCONNECTION REQUESTS

To incorporate the Interconnection Customers' request, a re-dispatch of existing generation within SPP and MISO was performed with respect to the amount of the Customers' injection. **Table 3-2** outlines the dispatch of MISO requests in the SPP models.

Table 3-2 outlines how higher queued and current study MISO requests are dispatched in the SPP cases. MISO projects are dispatched across the SPP footprint using load factor ratios. All MISO generation dispatched by SPP was sunk to the MISO Classic (West) footprint, whether ERIS or NRIS.

Table 3-2: Dispatch of MISO Requests in SPP Models

Dispatch Type	Season	Service Type	Renewable (in group)	Renewable (out of group)	Conventional (in group)	Conventional (out of group)
ERIS HVER	All	All	100%	20%	N/A	N/A
ERIS LVER	Peak	All	20%	20%	100%	100%
NRIS	Spring and Light Load	ERIS	Off	Off	Off	Off
		NRIS	100%	20%	100%	20%
	Peak	ERIS	Off	Off	Off	Off
		NRIS	100%	100%	100%	100%

HVER – High Variable Energy Resource Dispatch

LVER – Low Variable Energy Resource Dispatch

N/A – units are not dispatched up from base case amounts

Renewable – Includes wind, solar, and storage

Conventional – Includes nuclear, hydro, coal, cc, CT, oil, waste heat

3.5 DYNAMIC STABILITY AND SHORT CIRCUIT

3.5.1 DYNAMIC STABILITY

Dynamic stability studies performed as part of the PISIS and DISIS Cluster Studies will provide additional guidance as to whether required reactive compensation can be static or a portion must be dynamic (such as a SVC).

3.5.2 SHORT CIRCUIT

The Year 2 and Year 10 dynamic stability summer peak models were used for short-circuit analysis.

4 IDENTIFICATION OF NETWORK CONSTRAINTS (SYSTEM PERFORMANCE)

4.1 THERMAL OVERLOADS

Network constraints are found by using PSS/E MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels previously described.

For Energy Resource Interconnection Service (ERIS), thermal overloads are determined for system intact (n-0) greater than 100% of Rate A - normal and for contingency (n-1) greater than 100% of Rate B – emergency conditions.

The overloads are then screened to determine which interconnection requests have at least

- 3% Distribution Factor (DF) for system intact conditions (n-0),
- 20% DF upon outage-based conditions (n-1),
- or 3% DF on contingent elements that resulted in a non-converged solution.

Appropriate transmission reinforcements are identified to mitigate the constraints.

Interconnection Requests that requested Network Resource Interconnection Service (NRIS) are also studied in a separate NRIS analysis to determine if any constraint measured greater than or equal to a 3% DF. If so, these constraints are also assigned transmission reinforcements to mitigate the impacts.

4.2 VOLTAGE

Steady State Voltage analysis is performed as part of the PISIS and DISIS Cluster Studies will provide additional guidance as to whether required reactive compensation. Monitored facilities and transmission reinforcement criteria for this analysis will be provided during the PISIS and/or DISIS report

4.3 DYNAMIC STABILITY

Dynamic stability studies performed as part of the PISIS and DISIS Cluster Studies will provide additional guidance as to whether required reactive compensation can be static or a portion must be dynamic (such as a SVC). During the PISIS and/or DISIS Stability issues are considered for transmission reinforcement under ERIS. Generators that fail to meet low voltage ride-through requirements (FERC Order #661-A) or SPP's stability criteria for damping or dynamic voltage recovery are assigned upgrades such that these requirements can be met.

4.4 UPGRADES ASSIGNED

In no way does the list of constraints in Appendix G identify all potential constraints that guarantee operation for all periods of time. It should be noted that although this study analyzed many of the

most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer(s) may be required to reduce their generation output to 0 MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

5 POWER FLOW ANALYSIS AND RESULTS

5.1 POWER FLOW ANALYSIS METHODOLOGY

The Direct Current (DC) FCITC function of PSS® MUST was used to simulate single element and special (i.e., breaker-to-breaker, multi-element, etc.) contingencies in portions or all of the modeled control areas of SPP, as well as, other control areas external to SPP and the resulting scenarios analyzed. Single element and multi-element contingencies are evaluated.

Table 5-1: Most Severe ERIS Constraints for Mitigation

Group	Season	Source	Mont Commmon Name	TDF	Rating	Contingency Loading %	Contname
06ALLP_SP	18G	GEN_18075_T_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42	1029.4	100.96	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63	1029.4	100.96	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_P_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42	1029.4	100.86	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63	1029.4	100.86	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_S_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42	1029.4	100.82	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63	1029.4	100.82	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'

Table 5-2: Most Severe NRIS Constraints for Mitigation

Group	Season	Source	Mont Commmon Name	TDF	Rating	Contingency Loading %	Contname
09NR	21L	GEN_18066_P	'MONOLITH 7 115.00 - SHELDON 115KV CKT 1'	0.042	327.9	135.47	'MONOLITH 3 345.00 - MOORE 345KV CKT 1'

Complete FCITC results can be found in **Appendix E**.

5.2 CURTAILMENT AND SYSTEM RELIABILITY

In no way does this study guarantee operation for all periods of time. It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer(s) may be required to reduce their generation output to 0 MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

6 STABILITY & SHORT CIRCUIT ANALYSIS

Stability is not applicable to the FCS queue. Short Circuit Analysis was performed for each generators POI. The Short Circuit Analyses results are found in **Appendix E**.

7 REQUIRED INTERCONNECTION FACILITIES

Table 7-5 outlines the estimated interconnection costs for each request per FCITC scenario. Please note that not all requested points of interconnection were viable and were subsequently not studied. Also, some points of interconnection, while examined in this analysis, may not be viable in the future (i.e. available outlets being filled by higher queued requests).

- **Costs Not Included** – Costs on Affected Systems for Associated Electric Cooperative Inc. (AECI), Mid-Continent Independent System Operator (MISO), and Minnkota Power Cooperative, Inc (MPC). Impacts to affected systems will be coordinated with the Affected System operators if the Interconnection Request(s) enter into the Definitive Interconnection System Impact Study (DISIS) Queue.
- **Costs Not Included** –Potential upgrades required for AC voltage or transient stability constraints. Impacts to AC voltage and transient stability analysis are evaluated during the Preliminary Interconnection System Impact Study (PISIS) or DISIS Queue.

Table 7-1: ERIS Constraints for Mitigation

Monitored Element	TDF	Rating	Contingency Loading %	Contingency	Mitigation	Network Upgrade Cost
'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42	1029.4	100.96	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'	Reconductor 52 miles of 345 kV	$72.8 M

Table 7-2: ERIS Cost Allocation per Request

Interconnection Request	Upgrade Name	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2018-075_P	Reconductor 52 miles of 345 kV from Crossroads – Tolk Ckt 1	Current Study	$28.4M	$72.8 M
GEN-2018-075_S	Reconductor 52 miles of 345 kV from Crossroads – Tolk Ckt 1	Current Study	$28.4M	$72.8 M
GEN-2018-075_T	Reconductor 52 miles of 345 kV from Crossroads – Tolk Ckt 1	Current Study	$28.4M	$72.8 M
GEN-2018-078_P	Reconductor 52 miles of 345 kV from Crossroads – Tolk Ckt 1	Current Study	$44.4M	$72.8 M

Table 7-3: NRIS Constraints for Mitigation

Monitored Element	TDF	Rating	Contingency Loading %	Contingency	Mitigation	Network Upgrade Cost
'MONOLITH 7 115.00 - SHELDON 115KV CKT 1'	0.04282	327.9	135.47	'MONOLITH 3 345.00 - MOORE 345KV CKT 1'	Rebuild 0.5 miles of 115 kV	$500,000

Table 7-4: NRIS Cost Allocation per Request

Interconnection Request	Upgrade Name	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2018-066_P	Rebuild 0.5 miles of 115 kV from Monolith – Sheldon Ckt 1	Current Study	$500,000	$500,000

Table 7-5: Estimated Interconnection Costs per Scenario

Scenario	Interconnection Request(s)	Scenario Description	Point of Interconnection (POI) Studied	Interconnection Costs	ERIS Network Upgrade Costs	NRIS Network Upgrade Costs	Total Estimated Cost
Scenario 1	GEN-2018-066	Group 09 ERIS & Group 09 NRIS	(P) Gerald Gentlemen 345 kV	$5-10 Million range pending a more detailed engineering design and facility study	--	$500,000	$5.5-10.5M
Scenario 2	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(T) Kiowa 345 kV	$5 million	$28.4M	--	$33.4M
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV	$12 million	$44.4M	--	$56.4M
Scenario 3	GEN-2018-127	Group 08 ERIS & Group 08 NRIS	(P) Cresent 138 kV	$3 million	--	--	$3M
Scenario 4	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(P) Bopco 345 kV	$6.4 million	$28.4M	--	$34.8M
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV	$12 million	$44.4M	--	$56.4M
Scenario 5	GEN-2018-075	Group 06 ERIS & Group 06 NRIS	(S) Bopco 115 kV	$0[1]	$28.4M	--	$28.4M
	GEN-2018-078		(P) Tap Eddy Co. – Crossroads 345 kV	$12 million	$44.4M	--	$56.4M

7.1 FACILITIES ANALYSIS

If requests proceed to the DISIS queue, the interconnecting Transmission Owner for each Interconnection Request will provide its preliminary analysis of required Transmission Owner

[1] The interconnection cost for GEN-2018-075 (S) assumes that the interconnection customer is responsible for 100% of the interconnection facility.

Interconnection Facilities and the associated Network Upgrades. This analysis will be limited only to the expected facilities to be constructed by the Transmission Owner at the Point of Interconnection.

7.2 ENVIRONMENTAL REVIEW

For Interconnection Requests that result in an interconnection to, or modification to, the transmission facilities of the Western-UGP, a National Environmental Policy Act (NEPA) Environmental Review will be required. The Interconnection Customer will be required to execute an Environmental Review Agreement per Section 8.6.1 of the GIP.

8 DETERMINATION OF COST ALLOCATED NETWORK UPGRADES

Cost Allocated Network Upgrades of Variable Energy Resources (VER) (solar/wind) generation interconnection requests are determined using the Year 2 spring model. Cost Allocated Network Upgrades of peaking units are determined using the Year 5 summer peak model. A PSS/E and MUST sensitivity analysis is performed to determine the Distribution Factors (DF), a distribution factor with no contingency that each generation interconnection request has on each new upgrade. The impact each generation interconnection request has on each upgrade project is weighted by the size of each request. Finally, the costs due by each request for a particular project are then determined by allocating the portion of each request's impact over the impact of all affecting requests.

For example, assume that there are three Generation Interconnection requests, X, Y, and Z that are responsible for the costs of Upgrade Project '1'. Given that their respective PTDF for the project have been determined, the cost allocation for Generation Interconnection request 'X' for Upgrade Project 1 is found by the following set of steps and formulas:

Determine an impact factor for a given project for all responsible GI requests:

$$Request\ X\ Impact\ Factor\ on\ Upgrade\ Project\ 1 = PTDF(\%)(X) \times MW(X) = X1$$

$$Request\ Y\ Impact\ Factor\ on\ Upgrade\ Project\ 1 = PTDF(\%)(Y) \times MW(Y) = Y1$$

$$Request\ Z\ Impact\ Factor\ on\ Upgrade\ Project\ 1 = PTDF(\%)(Z) \times MW(Z) = Z1$$

Determine each request's Allocation of Cost for that particular project:

$$Request\ X's\ Project\ 1\ Cost\ Allocation\ (\$) = \frac{Network\ Upgrade\ Project\ 1\ Cost\ (\$) \times X1}{X1 + Y1 + Z1}$$

Repeat previous for each responsible GI request for each Project.

The cost allocation of each needed Network Upgrade is determined by the size of each request and its impact on the given project. This allows for the most efficient and reasonable mechanism for sharing the costs of upgrades.

8.1 CREDITS/COMPENSATION FOR AMOUNTS ADVANCED FOR NETWORK UPGRADES

Interconnection Customer shall be entitled to either credits or potentially incremental Long Term Congestion Rights (iLTCR), otherwise known as compensation, in accordance with Attachment Z2 of the SPP Tariff for any Network Upgrades, including any tax gross-up or any other tax-related payments associated with the Network Upgrades, and not refunded to the Interconnection Customer.

9 AFFECTED SYSTEMS COORDINATION

Impacts to affected systems will be coordinated with the Affected System operators if the Interconnection Request(s) enter into the DISIS Queue.

The following procedures are in place to coordinate with Affected Systems.

- Impacts on Associated Electric Cooperative Inc. (AECI) – For any observed violations of thermal overloads on AECI facilities, AECI has been notified by SPP to evaluate the violations for impacts on its transmission system. AECI has instructed SPP to notify the affected Interconnection Customers after posting of this study to contact AECI for an Affected System Study Agreement to study further impacts on the AECI system.
- Impacts on Mid Continent Independent System Operation (MISO) – Per SPP's agreement with MISO, MISO will be contacted and provided a list of interconnection requests that proceed to move forward into the Interconnection Facilities Study Queue. MISO will then evaluate the Interconnection Requests for impacts and will be in contact with affected Interconnection Customers.
- Impacts on Minnkota Power Cooperative, Inc (MPC) – MPC will be contacted and provided a list of interconnection requests that proceed to move forward into the Interconnection Facilities Study Queue. MP will then evaluate the Interconnection Requests for impacts.
- Impacts to other affected systems – For any observed violations of thermal overloads or voltage constraints, SPP will contact the owner of the facility for further information.

10 CONCLUSION

The minimum cost of interconnecting all new generation interconnection requests per scenario included is outlined in **Table 7-5**. These costs, and other upgrades associated with Network Constraints do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer submits a Transmission Service Request (TSR) through SPP's Open Access Same Time Information System (OASIS) as required by Attachment Z1 of the SPP Open Access Transmission Tariff (OATT).

For Interconnection Requests that result in an interconnection to, or modification of, the transmission facilities of the Western-UGP (WAPA), a National Environmental Policy Act (NEPA) Environmental Review will be required. The Interconnection Customer will be required to execute an Environmental Review Agreement per Section 8.6.1 of the GIP.

11 APPENDICES

11.1 APPENDIX A

Table 11-1: SPP Transmission Expansion Plan, Balanced Portfolio, and Recently Approved Priority Projects

SPP Notification to Construct (NTC) ID		UID	Project Owner	Upgrade Name	Estimated Date of Upgrade Completion (EOC)
200223			OGE	Tatonga - Woodward District EHV 345 kV Ckt 2	3/1/2018
200223			OGE	Matthewson - Tatonga 345 kV Ckt 2	3/1/2018
200240			OGE	Chisholm - Gracemont 345 kV Ckt 1 (OGE)	3/1/2018
200255			AEP	Chisholm - Gracemont 345kV Ckt 1 (AEP)	3/1/2018
200255			AEP	Chisholm 345/230 kV Substation	3/1/2018
200255			AEP	Chisholm 230 kV	3/1/2018
200360			SPS	IMC #1 Tap - Livingston Ridge 115 kV Ckt 1 Rebuild	11/16/2018
200360			SPS	Intrepid West - Potash Junction 115 kV Ckt 1 Rebuild	11/16/2018
200360			SPS	IMC #1 Tap - Intrepid West 115 kV Ckt 1 Rebuild	11/16/2018
200360			SPS	Cardinal - Targa 115 kV Ckt 1 Rebuild	5/31/2018
200360		51250	SPS	National Enrichment Plant - Targa 115 kV Ckt 1	12/15/2018
200391		51528	OGE	DeGrasse 345 kV Substation	6/1/2019
200391		51529	OGE	DeGrasse 345/138 kV Transformer	6/1/2019
200391		51530	OGE	DeGrasse - Knob Hill 138 kV New Line	6/1/2019
200391		51569	OGE	DeGrasse 138 kV Substation (OGE)	6/1/2019
200220			NPPD	Cherry Co. (Thedford) - Gentleman 345 kV Ckt 1	10/1/2019
200220			NPPD	Cherry Co. (Thedford) Substation 345 kV	10/1/2019
200220			NPPD	Cherry Co. (Thedford) - Holt Co. 345 kV Ckt 1	10/1/2019
200220			NPPD	Holt Co. Substation 345 kV	10/1/2019
200253		50441	NPPD	Neligh 345/115 kV Substation	4/1/2018
200309			SPS	Hobbs 345/230 kV Ckt 1 Transformer	6/1/2018
200309			SPS	Hobbs - Yoakum 345 kV Ckt 1	6/1/2020
200395			SPS	Tuco - Yoakum 345 kV Ckt 1	6/1/2020
200395			SPS	Yoakum 345/230 kV Ckt 1 Transformer	6/1/2020
200256		50722	SPS	Chaves - Price 115 kV Ckt 1 Rebuild	1/30/2018
200256		50723	SPS	CV Pines - Price 115 kV Ckt 1 Rebuild	1/30/2018
200256		50724	SPS	Capitan - CV Pines 115 kV Ckt 1 Rebuild	1/30/2018
200282			SPS	China Draw - Yeso Hills 115 kV Ckt 1	6/1/2018
200282			SPS	Dollarhide - Toboso Flats 115 kV Ckt 1	6/1/2018
200309			SPS	Hobbs - Kiowa 345 kV Ckt 1	6/1/2018
200309			SPS	Kiowa 345 kV Substation	6/1/2018
200309			SPS	Kiowa - North Loving 345 kV Ckt 1	6/1/2018
200309			SPS	North Loving 345 kV Terminal Upgrades	6/1/2018
200309			SPS	China Draw - North Loving 345 kV Ckt 1	6/1/2018
200309			SPS	China Draw 345 kV Ckt 1 Terminal Upgrades	6/1/2018
200309			SPS	China Draw 345/115 kV Ckt 1 Transformer	6/1/2018
200309			SPS	North Loving 345/115 kV Ckt 1 Transformer	6/1/2018
200309			SPS	Kiowa 345/115 kV Ckt 1 Transformer	6/1/2018
200395		50924	SPS	Livingston Ridge 115 kV Substation Conversion	11/30/2017
200411			SPS	Livingston Ridge - Sage Brush 115 kV Ckt 1	6/1/2018
200309		50925	SPS	Sage Brush 115 kV Substation	12/16/2016

SPP Notification to Construct (NTC) ID		UID	Project Owner	Upgrade Name	Estimated Date of Upgrade Completion (EOC)
200309		50928	SPS	Largarto - Sage Brush 115 kV Ckt 1	12/15/2016
200309		50927	SPS	Lagarto 115 kV Substation	6/1/2018
200309		50951	SPS	Cardinal - Lagarto 115 kV Ckt 1	12/15/2016
200309		50967	SPS	Cardinal 115 kV Substation	12/15/2016
200411		50923	SPS	Ponderosa - Ponderosa Tap 115 kV Ckt 1	6/1/2017
200395			SPS	Canyon West – Dawn – Panda – Deaf Smith 115kV Ckt 1	12/15/2018
200369			SPS	Canyon East Sub – Randall County Interchange 115kV Ckt 1	12/31/2020
200359		11509	SPS	Carlisle 230/115kV transformer replacement	3/27/2018
200309			SPS	Hobbs – Yoakum – TUCO 345kV project	6/1/2018
200395			SPS	Terry County – Wolfforth 115kV Ckt 1 terminal equipment replacement	6/1/2018
200391			OGE	DeGrasse 345/138kV project	6/1/2019
200396			WFEC	DeGrasse 345/138kV project	12/31/2019
200395			SPS	Harrington East – Potter 230kV Ckt 1 terminal equipment replacement	6/1/2019
200228			WERE	Viola 345/138kV project	6/1/2018
200228			MKEC	Viola 345/138kV project	6/1/2018
200395			SPS	Seminole 230/115kV transformer Ckt 1 & 2 replacement	5/15/2018
200262			SPS	Yoakum County Interchange 230/115kV transformer Ckt 1 & 2 replacement	6/1/2019
210507				Multi - China Draw - Road Runner 345 kV	6/1/2024

11.2 APPENDIX B

Table B-1: Higher Queued SPP Network Upgrades Included in the Analysis

Assigned Study	Upgrade Name	Estimated Date of Upgrade Completion (EOC)
DISIS-2010-002	Twin Church - Dixon County 230kV Line Upgrade	
DISIS-2010-002	Buckner - Spearville 345 kV Ckt 1 Terminal Upgrades	
DISIS-2011-001	Hoskins - Dixon County 230kV Line Upgrade	
DISIS-2014-002	Plant X - Tolk 230kV rebuild circuit #1	
DISIS-2014-002	Plant X - Tolk 230kV rebuild circuit #2	
DISIS-2014-002	TUCO Interchange 345/230kV CKT 1 Replacement	
DISIS-2015-001	(NRIS Only) Renfrow – Renfrow 138kV circuit #1 rebuild.	
DISIS-2015-001	Oklaunion 345kV Reactive Power	
DISIS-2015-002	Beaver County 345kV Reactive Power Support Install +100Mvar SVC at Beaver County Substation.	
DISIS-2015-002	Border - Chisholm 345kV CKT 1 & 2	
DISIS-2015-002	Bushland - Potter County 230kV CKT 1	
DISIS-2015-002	Carlisle 115/69/13kV Transformer CKT 1	
DISIS-2015-002	Chisholm Substation Upgrade 345kV	
DISIS-2015-002	Cleo Corner - Cleo Plant Tap 138kV CKT 1	
DISIS-2015-002	Cleveland - Silver City 138kV CKT 1	
DISIS-2015-002	Cornville Tap - Naples Tap 138kV CKT 1	
DISIS-2015-002	Crawfish Draw 345/230kV Substation Upgrade Taps TUCO – Border 345kV, TUCO – Oklaunion 345kV, and TUCO – Swisher 230kV Build 345/230/13kV transformer	
DISIS-2015-002	Crawfish Draw - Border 345kV CKT 2	
DISIS-2015-002	Daglum - Dickinson 230kV CKT 1	
DISIS-2015-002	Dickinson 230/115/13.8kV CKT 2	
DISIS-2015-002	Gavins Point - Yankton Junction 115kV CKT 1	
DISIS-2015-002	GEN-2015-063 Tap - Mathewson 345kV CKT 1	
DISIS-2015-002	Grapevine - Wheeler 230kV CKT 1	
DISIS-2015-002	Naples Tap - Payne 138kV CKT 1	
DISIS-2015-002	Norge - Southwest Station 138kV CKT 1	
DISIS-2015-002	Potter County Interchange 345/230/13kV Transformer circuit #2, build.	
DISIS-2015-002	Albion - Petersburg - North Petersburg 115kV CKT 1	
DISIS-2015-002	Wheeler - Sweetwater 230kV CKT 1	
DISIS-2015-002	Woodward 345/138/13kV Transformer CKT 3	
DISIS-2016-001	Andrews 345/115/13kV Transformer CKT 1 Replace 230/115kV transformer CKT 1 with 345/115kV transformer	
DISIS-2016-001	Andrews 345/115/13kV Transformer CKT 2 Replace 230/115kV transformer CKT 2 with 345/115kV transformer	
DISIS-2016-001	Andrews Substation Voltage Conversion Convert Andrews 230kV to 345kV	
DISIS-2016-001	Atwood Capacitive Reactive Power Support Install 10 Mvars of Capicator Bank(s)	
DISIS-2016-001	Banner County - Keystone 345kV CKT 1	

Assigned Study	Upgrade Name	Estimated Date of Upgrade Completion (EOC)
	Build approximately 140 of new 345kV from Banner County to Keystone. Banner County and Keystone Substation Work.	
DISIS-2016-001	Beaver County - Clark County 345kV CKT 1 Build approximately 125 miles of new 345kV from Grapevine – Chisholm	
DISIS-2016-001	BEPC Laramie Stability Limit Potential mitigation for BEPC Laramie Stability Limit	
DISIS-2016-001	Border 345kV Reactive Power Support Install (6)Steps of 50Mvar Capacitor Bank(s) and +300Mvar SVC at Border Substation	
DISIS-2016-001	Cleveland - Cleveland 138kV CKT Z1 NRIS only required upgrade: Replace bus tie breaker with a three breaker ring	
DISIS-2016-001	Cleveland 345/138/13kV Transformer CKT 2 NRIS only required upgrade: Install second 345/138kV Transformer	
DISIS-2016-001	Crawfish Draw 230/115/13kV Transformer CKT 1 NRIS only required upgrade: Build 115kV yard, re-terminate Hale County - TUCO 115kV, build 230/115/13kV transformer 1	
DISIS-2016-001	Drinkard - Drinkard Tap 115kV CKT 1 Rebuild approximately 2 miles from Drinkard to Drinkard Tap	
DISIS-2016-001	Drinkard Tap - West Hobbs 115kV CKT 1 Rebuild approximately 12.5 miles from Drinkard Tap to West Hobbs	
DISIS-2016-001	Fairfax Tap - Shidler 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 2.4 miles of 138kV	
DISIS-2016-001	Farber - Belle Plains 138kV CKT 1 Rebuild approximately 10.3 miles of 138kV from Farber to Belle Plains	
DISIS-2016-001	GEN-2015-063 Tap - Woodring 345kV CKT 1	
DISIS-2016-001	Glenham - Mound City 230kV CKT 1 Uprate CT	
DISIS-2016-001	Hitchland 345/230/13kV Transformer CKT 3 NRIS only required upgrade: Build third 345/230/13kV Transformer	
DISIS-2016-001	Jamestown - Center 345kV CKT 1 MPC mitigation for Jamestown - Center 345kV	
DISIS-2016-001	Keystone - Gentleman 345kV CKT 2 Build approximately 30 miles of new 345kV. Gentleman and Keystone Substation Work.	
DISIS-2016-001	Kildare - White Eagle 138kV CKT 1 Rebuild approximately 11 miles of 138kV from Kildare to White Eagle	
DISIS-2016-001	Kinsley - Pawnee 115kV CKT 1 Increase conductor clearance	
DISIS-2016-001	Kinze - McElroy 138kV CKT 1 Rebuild approximately 2 miles of 138kV from Kinze to McElroy	
DISIS-2016-001	Lubbock Holly 230/69/13kV CKT 2 NRIS only required upgrade: Install second Lubbock Holly 230/69/13kV Transformer	
DISIS-2016-001	Middleton Tap - Chilocco 138kV CKT 1	

Assigned Study	Upgrade Name	Estimated Date of Upgrade Completion (EOC)
	Rebuild approximately 3.45 miles of 138kV from Middleton to Chilocco	
DISIS-2016-001	National Enrichment Plant - Drinkard 115kV CKT 1 Rebuild approximately 7.5 miles from NEF Plant to Drinkard	
DISIS-2016-001	Neosho - Riverton 161kV CKT 1 Rebuild approximately 28 miles of 161kV	
DISIS-2016-001	Northwest - Spring Creek 345kV CKT 1 Replace terminal equipment	
DISIS-2016-001	Oklaunion 345kV Reactive Power Support Incremental Upgrade Install 250Mvar capacitor banks and +/-100Mvar SVC at Oklaunion	
DISIS-2016-001	Osage - Webb Tap 138kV CKT 1 Rebuild approximately 22 miles of 138kV from Osage to Webb City	
DISIS-2016-001	Osage - White Eagle 138kV CKT 1 Rebuild approximately 3 miles of 138kV from Osage to White Eagle	
DISIS-2016-001	Potter - Chisholm 345kV CKT 1 Build approximately 140 miles of new 345kV from Potter County – Chisholm	
DISIS-2016-001	Shamrock 115kV Capacitor Bank Add 20Mvar of Capacitor Bank(s) at Shamrock 115kV	
DISIS-2016-001	Tolk - Crawfish Draw 345kV CKT 1 Build approximately 64 miles of 345kV from Tolk - Crawfish Draw.	
DISIS-2016-001	Tolk - Potter County 345kV CKT 1 Build approximately 115 miles of 345kV from Tolk - Potter County	
DISIS-2016-001	Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	
DISIS-2016-001	Webb City Tap - Fairfax Tap 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 0.3 miles of 138kV. Costs included in Fairfax Tap - Shidler Upgrade	
DISIS-2016-002	Please refer to Appendix F of the most recently posted DISIS-2016-002 for network upgrades and cost allocation per DISIS request.	

11.3 APPENDIX C

Table 11-2: Higher Queued SPP Interconnection Requests Included in the Analysis

Study	Generation Interconnection Number	SP PMAX	WP PMAX	Service	Group	Type	Status
PQ	ASGI-2010-006	150	150	ER	08 N-OK & S-KS	Wind	
PQ	GEN-2001-033	180.29	180.29	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2001-036	80	80	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2002-004	274.5	274.5	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2004-023N	75	75	ER	09 NEB	Coal	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2005-013	199.8	199.8	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2006-018	162	167.22	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2006-020N	42	42	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2006-026	502	508	ER	06 NM & W-TX	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2006-038N005	80	80	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2006-038N019	80	80	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2007-011N08	81	81	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	GEN-2008-119O	60	60	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
PQ	NPPD Distributed (Broken Bow)	7.3	7.3	ER	09 NEB	Heat	
PQ	NPPD Distributed (Burwell)	3	3	ER	09 NEB	Heat	
PQ	NPPD Distributed (Ord)	10.8	10.8	ER	09 NEB	Heat	
PQ	NPPD Distributed (Stuart)	1.8	1.8	ER	09 NEB	Heat	

PQ	NPPD Distributed (Columbus Hydro)	45	45	ER	09 NEB	Hydro	
PQ	WAPA SEAMS (Gavins Pt Hydro)	102	102	ER	09 NEB	Hydro	
PQ	WAPA SEAMS (Ft Randle Hydro)	352	352	ER	09 NEB	Hydro	
PQ	WAPA SEAMS (Spirit Mound Heat)	120	120	ER	09 NEB	Heat	
PQ	SPS Distributed (Hopi)	10	10	ER	06 NM & W-TX	Solar	
PQ	SPS Distributed (Monument)	10	10	ER	06 NM & W-TX	Solar	
PQ	SPS Distributed (Lea Road)	10	10	ER	06 NM & W-TX	Solar	
PQ	SPS Distributed (Jal)	10	10	ER	06 NM & W-TX	Solar	
PQ	SPS Distributed (Ocotillo)	10	10	ER	06 NM & W-TX	Solar	
PQ	NPPD Distributed (Burt County Wind)	12	12	ER	09 NEB	Wind	
PQ	NPPD Distributed (Buffalo County Solar)	10	10	ER	09 NEB	Solar	
PQ	Sunray	34.5	34.5	ER	06 NM & W-TX	Wind	Commerical Operation
ICS1	GEN-2007-025	299.2	299.2	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
ICS1	GEN-2008-013	299.04	299.04	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-09-1	GEN-2006-037N1	74.8	74.8	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-09-1	GEN-2006-044N	40.5	40.5	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-09-1	GEN-2008-086N02	201	201	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-09-1	GEN-2009-025	59.8	59.8	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-1	ASGI-2010-010	42.15	42.15	ER	06 NM & W-TX	Gas	
DIS-10-1	GEN-2008-022	299.65	299.65	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-1	GEN-2008-098	99.5	99.5	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION

DIS-10-1	GEN-2008-123N	89.7	89.7	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-1	GEN-2009-040	73.8	73.8	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-1	GEN-2010-003	99.5	99.5	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-1	GEN-2010-005	299.2	299.2	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-10-1	GEN-2010-006	180	205	ER	06 NM & W-TX	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-10-2	ASGI-2010-020	30	30	ER	06 NM & W-TX	Wind	
DIS-10-2	ASGI-2010-021	15	15	ER	06 NM & W-TX	Wind	
DIS-10-2	ASGI-2011-001	27.3	27.3	ER	06 NM & W-TX	Wind	Commerical Operation
DIS-10-2	GEN-2010-041	10.5	10.5	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-10-2	GEN-2010-046	56	56	ER	06 NM & W-TX	Gas	IA FULLY EXECUTED/ON SCHEDULE
DIS-10-2	GEN-2010-051	200	200	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-11-1	ASGI-2011-003	10	10	ER	06 NM & W-TX	Wind	
DIS-11-1	GEN-2010-055	4.5	4.5	ER	08 N-OK & S-KS	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-1	GEN-2011-018	73.6	73.6	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-1	GEN-2011-025	80	80	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-11-1	GEN-2011-027	120	120	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2-PQ	NPPD Distributed (North Platte - Lexington)	54	54	ER	09 NEB	Hydro	
DIS-11-2	ASGI-2011-004	19.8	19.8	ER	06 NM & W-TX	Wind	
DIS-11-2	GEN-2011-045	180	205	ER	06 NM & W-TX	NG CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2	GEN-2011-046	23	27	ER	06 NM & W-TX	Diesel CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2	GEN-2011-048	165	175	ER/NR	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION

DIS-11-2	GEN-2011-056	3.6	3.6	ER	09 NEB	Hydro	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2	GEN-2011-056A	3.6	3.6	ER	09 NEB	Hydro	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2	GEN-2011-056B	4.5	4.5	ER	09 NEB	Hydro	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-11-2	GEN-2011-057	150	150	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-1	GEN-2012-001	61.2	61.2	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	ASGI-2012-002	18.15	18.15	ER	06 NM & W-TX	Wind	
DIS-12-2	GEN-2012-020	477.1	477.1	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-12-2	GEN-2012-021	4.8	4.8	ER	09 NEB	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-032	350	350	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-033	98.82	98.82	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-034	7	7	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-035	7	7	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-036	7	7	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-037	195	203	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-12-2	GEN-2012-041	85.3	121.5	ER	08 N-OK & S-KS	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-1	ASGI-2013-002	18.4	18.4	ER	06 NM & W-TX	Wind	
DIS-13-1	ASGI-2013-003	18.4	18.4	ER	06 NM & W-TX	Wind	
DIS-13-1	GEN-2013-002	50.6	50.6	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/ON SUSPENSION
DIS-13-1	GEN-2013-008	1.2	1.2	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION

DIS-13-1	GEN-2013-012	68	147	ER	08 N-OK & S-KS	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-1	GEN-2013-016	193	203	ER	06 NM & W-TX	CT	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-2	ASGI-2013-005	1.65	1.65	ER	06 NM & W-TX	Wind	
DIS-13-2	GEN-2013-019	73.6	73.6	ER/ NR	09 NEB	Wind	IA FULLY EXECUTED/ON SUSPENSION
DIS-13-2	GEN-2013-022	25	25	ER/ NR	06 NM & W-TX	Solar	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-2	GEN-2013-028	495	495	ER	08 N-OK & S-KS	Gas	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-2	GEN-2013-029	299	299	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-13-2	GEN-2013-032	204	204	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-14-1	GEN-2014-001	200.6	200.6	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-14-1	GEN-2014-004	3.96	3.96	ER	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-1	GEN-2014-013	73.5	73.5	ER/ NR	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	ASGI-2014-014	54.3	54.3	ER	08 N-OK & S-KS	Thermal	
DIS-14-2	GEN-2013-027	150	150	ER/ NR	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-028	35	35	ER	08 N-OK & S-KS	CC	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-031	35.8	35.8	ER/ NR	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-032	10.22	10.22	ER/ NR	09 NEB	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-033	70	70	ER	06 NM & W-TX	Solar	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-034	70	70	ER	06 NM & W-TX	Solar	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-035	30	30	ER	06 NM & W-TX	Solar	IA FULLY EXECUTED/ON SCHEDULE
DIS-14-2	GEN-2014-039	73.39	73.39	ER/ NR	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE

DIS-14-2	GEN-2014-040	320	320	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-14-2	GEN-2014-064	248.4	248.4	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-1-PQ	GEN-2007-017IS	200	200	ER/NR	09 NEB	Wind	On Schedule
DIS-15-1-PQ	GEN-2007-018IS	200	200	ER/NR	09 NEB	Wind	On Schedule
DIS-15-1	ASGI-2015-002	2	2	ER	06 NM & W-TX	Wind	
DIS-15-1	ASGI-2015-004	54.3	54.3	ER	08 N-OK & S-KS	Thermal	
DIS-15-1	GEN-2015-001	200	200	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-1	GEN-2015-007	160	160	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-1	GEN-2015-014	150	150	ER	06 NM & W-TX	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-1	GEN-2015-015	154.56	154.56	ER/NR	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-1	GEN-2015-016	200	200	ER/NR	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-1	GEN-2015-023	300.72	300.72	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-1	GEN-2015-024	220	220	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-1	GEN-2015-025	220	220	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-2	GEN-2015-020	99.96	99.96	ER	06 NM & W-TX	Solar	IA PENDING
DIS-15-2	GEN-2015-034	200	200	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-047	300	300	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-2	GEN-2015-052	300	300	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-056	101.2	101.2	ER	06 NM & W-TX	WIND	IA PENDING
DIS-15-2	GEN-2015-062	4.51	4.51	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-063	300	300	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-2	GEN-2015-066	248.4	248.4	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SUSPENSION

DIS-15-2	GEN-2015-069	300	300	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-15-2	GEN-2015-073	200.1	200.1	ER/NR	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-076	158.4	158.4	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-087	66	66	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/ON SUSPENSION
DIS-15-2	GEN-2015-088	300	300	ER/NR	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-15-2	GEN-2015-090	220	220	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-16-1	ASGI-2016-002	0.35	0.35	ER	06 NM & W-TX	Wind	
DIS-16-1	ASGI-2016-004	5	5	ER	06 NM & W-TX	Wind	
DIS-16-1	GEN-2015-041	5	5	ER	06 NM & W-TX	CT	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-009	29	29	ER	08 N-OK & S-KS	Steam Turbine	IA FULLY EXECUTED/ON SCHEDULE
DIS-16-1	GEN-2016-015	100	100	ER	06 NM & W-TX	Solar	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-021	300	300	ER	09 NEB	WIND	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-022	151.8	151.8	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-023	301.06	301.06	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-031	1.5	1.5	ER	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/COMMERCIAL OPERATION
DIS-16-1	GEN-2016-032	200	200	ER/NR	08 N-OK & S-KS	Wind	IA FULLY EXECUTED/ON SUSPENSION
DIS-16-1	GEN-2016-043	230	230	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE
DIS-16-1	GEN-2016-050	250.7	250.7	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-056	200	200	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-061	250.7	250.7	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-062	250.7	250.7	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-068	250	250	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-069	31.35	31.35	ER	06 NM & W-TX	Solar	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-071	200.1	200.1	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-1	GEN-2016-073	220	220	ER	08 N-OK & S-KS	WIND	FACILITY STUDY STAGE
DIS-16-1	GEN-2015-089	200	200	ER	09 NEB	Wind	IA FULLY EXECUTED/ON SCHEDULE

DIS-16-1	GEN-2016-075	50	50	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2-PQ	ASGI-2017-008	158.6	158.6	ER/NR	08 N-OK & S-KS	Wind	
DIS-16-2	ASGI-2016-009	3	3	ER	06 NM & W-TX	Wind	
DIS-16-2	GEN-2015-099	70.4	70.4	ER	06 NM & W-TX	Solar	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-074	200	200	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-096	227.7	227.7	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-100	100	100	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-101	195	195	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-106	400	400	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-110	152	152	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-119	600	600	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-121	110	110	ER	06 NM & W-TX	Solar	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-123	298	298	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-124	150	150	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-125	74	74	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-128	176	176	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-133	187.5	187.5	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-134	187.5	187.5	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-135	100	100	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-136	75	75	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-137	187.5	187.5	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-138	187.5	187.5	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-139	100	100	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-140	75	75	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-141	700	700	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-143	175	175	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-144	175	175	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-145	175	175	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE

DIS-16-2	GEN-2016-146	175	175	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-147	40	40	ER	09 NEB	Solar	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-153	134	134	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-162	252	252	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-163	252	252	ER	08 N-OK & S-KS	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-165	202	202	ER	09 NEB	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-171	60.8	60.8	ER	06 NM & W-TX	Solar	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-172	231	231	ER	06 NM & W-TX	Wind	FACILITY STUDY STAGE
DIS-16-2	GEN-2016-177	14.4	17	ER	06 NM & W-TX	Gas Turbine	FACILITY STUDY STAGE

11.4 APPENDIX D

Table 11-3: Higher Queued MISO Interconnection Requests Included in the Analysis

Study	POI Bus Num	GEN Bus Num	GEN ID	Generation Interconnection Number	ERIS PMAX	NRIS PMAX	Service	Group	Type	Status
DIS-15-1-PQ	66201	635215	W	J411	150	150	NR	09 IA	Wind	Done
DIS-15-1-PQ	66201	635216	W	J411	125	125	NR	09 IA	Wind	Done
DIS-15-1-PQ	66201	635216	W1	J411	25	25	NR	09 IA	Wind	Done
DIS-15-1-PQ	631206	629922	1	J416	87.5	87.5	NR	09 IA	Wind	Done
DIS-15-1-PQ	631206	629922	2	J416	11.5	11.5	NR	09 IA	Wind	Done
DIS-15-1-PQ	631206	629923	1	J416	90	90	NR	09 IA	Wind	Done
DIS-15-1-PQ	631206	629923	2	J416	11.5	11.5	NR	09 IA	Wind	Done
DIS-15-2-PQ	635206	635258	W	J412	100	100	NR	09 IA	Wind	Done
DIS-15-2-PQ	635206	635259	W	J412	100	100	NR	09 IA	Wind	Done
DIS-15-2-PQ	631085	631242	1	J438	147	147	NR	09 IA	Wind	Done
DIS-15-2-PQ	631085	631242	2	J438	20	20	NR	09 IA	Wind	Done
DIS-15-2-PQ	631243	631248	1	J455	117.5	0	ER	09 IA	Wind	Done
DIS-15-2-PQ	631243	631248	2	J455	29.9	0	ER	09 IA	Wind	Done
DIS-15-2-PQ	631243	631249	1	J455	117.5	0	ER	09 IA	Wind	Done
DIS-15-2-PQ	631243	631249	2	J455	29.9	0	ER	09 IA	Wind	Done
DIS-16-1-PQ	85831	635585	W	J499	170	170	NR	09 IA	Wind	Active
DIS-16-1-PQ	85831	635586	W	J499	170	170	NR	09 IA	Wind	Active
DIS-16-1-PQ	635570	635577	W1	J500	168	168	NR	09 IA	Wind	Active
DIS-16-1-PQ	635570	635578	W2	J500	166	166	NR	09 IA	Wind	Active
DIS-16-1-PQ	635570	635579	W3	J500	166	166	NR	09 IA	Wind	Active
DIS-16-1-PQ	65200	65203	1	J527	125	125	NR	09 IA	Wind	Active
DIS-16-1-PQ	65200	65205	2	J527	125	125	NR	09 IA	Wind	Active
DIS-16-1-PQ	65300	65303	1	J528	100	100	NR	09 IA	Wind	Active
DIS-16-1-PQ	65300	65305	1	J528	100	100	NR	09 IA	Wind	Active

DIS-16-2-PQ	635590	85834	1	J583	200	200	NR	09 IA	Wind	Active
DIS-14-2-PQ	635368	635414	W	J285	125	125	NR	09 NEB	Wind	Done
DIS-14-2-PQ	635368	635415	W	J285	125	125	NR	09 NEB	Wind	Done
DIS-14-2-PQ	635034	635059	W	J343	150	150	NR	09 NEB	Wind	Done
DIS-14-2-PQ	631187	635884	W1	J344	168	168	NR	09 NEB	Wind	Done

11.5 APPENDIX E

Table 11-4: ERIS Constraints for Mitigation

Group	Season	Source	Mont Commmon Name	TDF	Rating	Contingency Loading %	Contname
06ALLP_SP	18G	GEN_18075_T_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42777	1029.4	100.9677	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.9677	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_T_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42777	1029.4	100.9677	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.9677	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_P_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42279	1029.4	100.869	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.869	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_P_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.42279	1029.4	100.869	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.869	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_S_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.4204	1029.4	100.8215	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.8215	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18075_S_SP	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.4204	1029.4	100.8215	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'
06ALLP_SP	18G	GEN_18078_P	'CROSSROADS 7345.00 - TOLK STATION 345KV CKT 1'	0.63665	1029.4	100.8215	'CRAWFISH765 765.00 - CROSSRDS765 765.00 765KV CKT 1'

Table 11-5: NRIS Constraints for Mitigation

Group	Season	Source	Mont Commmon Name	TDF	Rating	Contingency Loading %	Contname
09NR	21L	GEN_18066_P	'MONOLITH 7 115.00 - SHELDON 115KV CKT 1'	0.04282	327.9	135.4767	'MONOLITH 3 345.00 - MOORE 345KV CKT 1'

11.6 APPENDIX F

Short Circuit Analysis

11.6.1 GEN-2018-066 2018S:

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                              PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:28
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2018S WITH MMWG 2017S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                  THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 90661 [G18066_SUB  345.00] AMP    19074.6   -87.10
523853 [FINNEY     7345.00] AMP    10224.3   -85.81
530554 [ATWOOD 3    115.00] AMP     3008.0   -72.48
530555 [COLBY  3    115.00] AMP     6077.3   -80.52
530559 [PH RUN 3    115.00] AMP     4520.1   -77.67
530583 [POSTROCK7   345.00] AMP     7918.2   -84.57
530584 [POSTROCK6   230.00] AMP    10885.1   -84.71
530644 [COLBY  2    69.000] AMP     3956.9   -84.96
530682 [SEGNTP 3    115.00] AMP     4284.4   -75.23
530683 [SEGUIN 3    115.00] AMP     4074.7   -76.44
531351 [BREWSTR3    115.00] AMP     3101.1   -76.75
531353 [GOODLND3    115.00] AMP     2653.9   -75.63
531412 [GRINNEL3    115.00] AMP     3699.7   -77.20
531416 [CTYSERT3    115.00] AMP     9920.0   -84.65
531429 [MINGO  3    115.00] AMP    12487.6   -85.45
531433 [SCOTCTY3    115.00] AMP     8922.9   -83.71
531448 [HOLCOMB3    115.00] AMP    21536.6   -87.52
531449 [HOLCOMB7    345.00] AMP    10313.3   -85.83
531451 [MINGO  7    345.00] AMP     6232.1   -84.90
531464 [SETAB  3    115.00] AMP    10554.8   -85.38
531465 [SETAB  7    345.00] AMP     7088.6   -85.25
531501 [BUCKNER7    345.00] AMP     9400.1   -84.99
560062 [G15-088-TAP 345.00] AMP    11004.4   -85.11
560075 [G16-023-TAP 345.00] AMP     5946.0   -87.12
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560082 [G16-050-TAP 345.00] AMP     6987.3   -84.87
560090 [G16-034-TAP 345.00] AMP     6098.7   -86.41
560134 [ROSEMONT    115.00] AMP     6275.1   -73.80
562334 [G13-010-TAP 345.00] AMP     7604.7   -84.36
584650 [GEN-2015-023345.00] AMP     6848.9   -85.82
585020 [GEN-2015-064115.00] AMP     9847.6   -84.14
585030 [GEN-2015-065345.00] AMP     5696.0   -84.79
587090 [GEN-2016-023345.00] AMP     4989.5   -86.72
587190 [GEN-2016-029345.00] AMP     4989.5   -86.72
587220 [GEN-2016-034345.00] AMP     6098.7   -86.41
587350 [GEN-2016-050345.00] AMP     6279.4   -84.77
587450 [GEN-2016-067345.00] AMP     5696.0   -84.79
587680 [GEN-2016-074345.00] AMP     6466.5   -84.20
587780 [GEN-2016-096345.00] AMP     9200.9   -85.01
587784 [G16-096-TAP 345.00] AMP     9223.1   -85.04
587850 [GEN-2016-106345.00] AMP     8959.2   -85.52
587874 [G16-110-TAP 345.00] AMP     6456.4   -87.33
588220 [GEN-2016-147115.00] AMP     4094.2   -83.74
588340 [GEN-2016-165345.00] AMP     5810.5   -85.91
588344 [G16-165-TAP 345.00] AMP     6866.0   -86.11
640050 [AINSWND7    115.00] AMP     3697.6   -76.25
640051 [AINSWRT7    115.00] AMP     3404.8   -74.75
640063 [AURORA_7    115.00] AMP     6924.4   -79.49
640065 [AXTELL 3    345.00] AMP     9415.5   -84.80
640066 [AXTELL 7    115.00] AMP    14107.0   -84.50
640082 [BEVERLY7    115.00] AMP     4610.2   -80.63
640083 [BEVERLY8    69.000] AMP     4230.9   -83.80
640089 [BROKENB7    115.00] AMP     5506.7   -78.78
640091 [BRULE  7    115.00] AMP     5410.3   -76.58
640093 [C.CREEK4    230.00] AMP     7041.2   -83.35
640094 [C.CREEK7    115.00] AMP     7157.1   -84.76
640096 [CALAMS 7    115.00] AMP     3402.4   -75.02
640098 [CALAWAY7    115.00] AMP     3850.1   -74.88
640100 [CAMBRIG7    115.00] AMP     4038.9   -77.12
640101 [CAMBRIG8    69.000] AMP     2195.7   -82.44
640102 [CANADAY4    230.00] AMP     6199.4   -83.41
640103 [CANADAY7    115.00] AMP    13705.7   -81.92
640107 [CENCITY7    115.00] AMP     5041.4   -73.13
640131 [COLMB.W4    230.00] AMP     9604.3   -84.32
640133 [COLMBUS4    230.00] AMP    11142.5   -84.76
640139 [COOPER 3    345.00] AMP    26663.6   -85.94
640161 [ELMCRK_7    115.00] AMP     5893.0   -74.52
640167 [ENDERS 7    115.00] AMP     3707.0   -77.72
640168 [ENDERS 8    69.000] AMP     3008.0   -83.23
640178 [GENEVA 7    115.00] AMP     9714.4   -78.75
640183 [GENTLMN3    345.00] AMP    19074.6   -87.10
640184 [GENTLMN4    230.00] AMP    20267.9   -87.30
640194 [GOSPER 7    115.00] AMP     4254.9   -77.16
640196 [GOTHNBG7    115.00] AMP     4279.9   -74.97
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640200 [GR ISLD4    230.00] AMP    16413.4   -84.87
640201 [GR ISLD7    115.00] AMP    22688.3   -84.03
640214 [HASTING4    230.00] AMP     7246.2   -84.57
640215 [HASTING7    115.00] AMP    19039.2   -82.74
640222 [HILDRTH7    115.00] AMP     4189.7   -75.94
640224 [HOLDREG7    115.00] AMP     6020.0   -78.70
640238 [JEFFREY7    115.00] AMP     5955.6   -78.99
640240 [JOHN.1 7    115.00] AMP     8206.4   -77.26
640242 [JOHN.2 7    115.00] AMP    12499.5   -80.34
640248 [KEAR.NE7    115.00] AMP     9029.6   -80.17
640250 [KEARNEY7    115.00] AMP    11574.1   -80.91
640252 [KEYSTON3    345.00] AMP    12222.4   -86.36
640253 [KEYSTON7    115.00] AMP    15479.1   -86.47
640255 [KINGSLY7    115.00] AMP     9292.5   -82.50
640261 [LOWELL 7    115.00] AMP     7988.0   -77.65
640265 [MALONEY7    115.00] AMP    11248.5   -80.04
640267 [MAXWELS7    115.00] AMP     6636.1   -81.37
640269 [MCCOOK 7    115.00] AMP     7566.4   -78.96
640270 [MCCOOK 8    69.000] AMP     4241.9   -84.21
640271 [MCCOOL 3    345.00] AMP    10255.5   -84.50
640272 [MCCOOL 7    115.00] AMP    13931.7   -84.01
640273 [MCCOOL     869.000] AMP     5450.2   -87.18
640275 [MINDEN 7    115.00] AMP     7082.5   -80.49
640277 [MOORE  3    345.00] AMP    21170.6   -85.26
640278 [SHELDON7    115.00] AMP    31634.1   -85.35
640286 [N.PLATT4    230.00] AMP    13383.0   -84.75
640287 [N.PLATT7    115.00] AMP    18549.0   -84.73
640288 [N.PLATT8    69.000] AMP     4909.6   -87.38
640302 [OGALALA4    230.00] AMP     7851.0   -84.95
640304 [OGALALANPPD7115.00] AMP    15003.1   -85.04
640310 [ORLEANS7    115.00] AMP     2349.7   -70.64
640312 [PAULINE3    345.00] AMP     8029.5   -84.34
640313 [PAULINE7    115.00] AMP    16131.5   -81.83
640314 [PAULINE8    69.000] AMP     4707.8   -86.91
640325 [REDWILO3    345.00] AMP     6246.9   -84.44
640326 [REDWILO7    115.00] AMP    10368.2   -80.78
640330 [RIVERDL4    230.00] AMP     6997.1   -83.19
640331 [RIVERDL7    115.00] AMP    11828.6   -81.59
640353 [ST.LIB 7    115.00] AMP     9501.9   -76.42
640359 [STAPLETON  7115.00] AMP     4141.9   -82.08
640360 [STAPLETON  869.000] AMP     3166.2   -85.22
640365 [STOCKVL7    115.00] AMP     4418.9   -74.61
640366 [STOCKVL8    69.000] AMP     3234.8   -82.15
640370 [SUTHLND7    115.00] AMP     5423.0   -77.12
640374 [SWEET W3    345.00] AMP    10961.3   -85.24
640381 [THEDFRD7    115.00] AMP     9192.5   -85.46
640383 [TOWER  7    115.00] AMP     8724.0   -81.64
640413 [YORK SW7    115.00] AMP     7978.6   -80.34
640448 [HOLDREGE   869.000] AMP     3654.1   -84.90
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640500 [THEDFORD3   345.00] AMP     5814.2   -85.05
640510 [HOLT.CO3    345.00] AMP     7464.9   -85.90
640530 [STEGALL7    115.00] AMP     7996.2   -86.70
641088 [HASTCTY7    115.00] AMP    19039.2   -82.74
641244 [ATHEY  7    115.00] AMP     3029.5   -77.21
642071 [SUB-D  7    115.00] AMP    16965.8   -80.89
642072 [SUB-E  7    115.00] AMP    16475.6   -83.16
650114 [NW68HOLDRG3 345.00] AMP    16352.0   -85.01
650189 [103&ROKEBY3 345.00] AMP    19591.5   -85.09
652532 [GR PRAIRIE 3345.00] AMP     6837.8   -86.12
652832 [GRPRAR1-LNX3345.00] AMP     6837.8   -86.12
653571 [GR ISLD3    345.00] AMP    12172.5   -84.94
653572 [SIDNEY 7    115.00] AMP     4196.7   -84.21
653871 [GR ISLD-LNX3345.00] AMP    12172.5   -84.94
659131 [LARAMIE3    345.00] AMP     7380.5   -87.77
659133 [SIDNEY 3    345.00] AMP     6661.7   -85.93
659134 [SIDNEY 4    230.00] AMP     6487.2   -85.65
659135 [STEGALL3    345.00] AMP     5083.0   -86.12
659206 [STGXFMR4    230.00] AMP     5548.1   -86.35
659210 [SIDXFMR4    230.00] AMP     7009.1   -86.17
659425 [SIDNEY1-LNX3345.00] AMP     6661.7   -85.93
659426 [SIDNEY2-LNX3345.00] AMP     6661.7   -85.93
659800 [GRANTNB7    115.00] AMP     6284.5   -79.06
659801 [OGALALA7    115.00] AMP    15003.1   -85.04
659809 [ROSCOE 7    115.00] AMP     6368.8   -80.70
659810 [SPCREEK7    115.00] AMP     4356.2   -77.69
659817 [COLTON 7    115.00] AMP     3675.6   -81.01
659824 [MCONGHY7    115.00] AMP     5391.3   -77.29
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11.6.2 GEN-2018-066 2026S

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                              PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:28
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2026S WITH MMWG 2026S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                    THREE PHASE FAULT
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X---------- BUS ----------X          /I+/    AN(I+)
 90661 [G18066_SUB  345.00] AMP    19229.6   -87.10
523853 [FINNEY     7345.00] AMP    10350.7   -85.83
530554 [ATWOOD 3    115.00] AMP     3010.9   -72.47
530555 [COLBY  3    115.00] AMP     6091.5   -80.52
530559 [PH RUN 3    115.00] AMP     4527.9   -77.67
530583 [POSTROCK7   345.00] AMP     7939.0   -84.56
530584 [POSTROCK6   230.00] AMP    10921.2   -84.69
530644 [COLBY  2    69.000] AMP     3959.3   -84.96
530682 [SEGNTP 3    115.00] AMP     4290.4   -75.22
530683 [SEGUIN 3    115.00] AMP     4080.3   -76.43
531351 [BREWSTR3    115.00] AMP     3105.5   -76.74
531353 [GOODLND3    115.00] AMP     2657.0   -75.63
531412 [GRINNEL3    115.00] AMP     3704.9   -77.20
531416 [CTYSERT3    115.00] AMP     9994.3   -84.65
531429 [MINGO  3    115.00] AMP    12566.4   -85.48
531433 [SCOTCTY3    115.00] AMP     9000.7   -83.71
531448 [HOLCOMB3    115.00] AMP    22418.4   -87.43
531449 [HOLCOMB7    345.00] AMP    10443.2   -85.85
531451 [MINGO  7    345.00] AMP     6306.4   -84.95
531464 [SETAB  3    115.00] AMP    10640.1   -85.38
531465 [SETAB  7    345.00] AMP     7160.9   -85.27
531501 [BUCKNER7    345.00] AMP     9451.5   -84.99
560062 [G15-088-TAP 345.00] AMP    11061.9   -85.12
560075 [G16-023-TAP 345.00] AMP     5949.4   -87.12
560082 [G16-050-TAP 345.00] AMP     7004.5   -84.86
560090 [G16-034-TAP 345.00] AMP     6105.7   -86.40
560134 [ROSEMONT    115.00] AMP     6338.4   -73.74
562334 [G13-010-TAP 345.00] AMP     7621.8   -84.35
584650 [GEN-2015-023345.00] AMP     6861.3   -85.83
585020 [GEN-2015-064115.00] AMP     9893.5   -84.16
585030 [GEN-2015-065345.00] AMP     5756.7   -84.82
587090 [GEN-2016-023345.00] AMP     4991.8   -86.72
587190 [GEN-2016-029345.00] AMP     4991.8   -86.72
587220 [GEN-2016-034345.00] AMP     6105.7   -86.40
587350 [GEN-2016-050345.00] AMP     6293.1   -84.77
587450 [GEN-2016-067345.00] AMP     5756.7   -84.82
587680 [GEN-2016-074345.00] AMP     6484.4   -84.20
587780 [GEN-2016-096345.00] AMP     9240.9   -85.01
587784 [G16-096-TAP 345.00] AMP     9263.3   -85.04
587850 [GEN-2016-106345.00] AMP     8985.3   -85.51
587874 [G16-110-TAP 345.00] AMP     6459.3   -87.32
588220 [GEN-2016-147115.00] AMP     4096.1   -83.74
588340 [GEN-2016-165345.00] AMP     5813.0   -85.91
588344 [G16-165-TAP 345.00] AMP     6869.5   -86.11
640050 [AINSWND7    115.00] AMP     3697.9   -76.25
640051 [AINSWRT7    115.00] AMP     3405.1   -74.74
640063 [AURORA_7    115.00] AMP     6981.5   -79.50
640065 [AXTELL 3    345.00] AMP     9456.9   -84.80
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640066 [AXTELL 7    115.00] AMP    14153.5   -84.48
640082 [BEVERLY7    115.00] AMP     4739.7   -80.86
640083 [BEVERLY8    69.000] AMP     4294.9   -83.97
640089 [BROKENB7    115.00] AMP     5512.6   -78.76
640091 [BRULE  7    115.00] AMP     5415.8   -76.57
640093 [C.CREEK4    230.00] AMP     7070.5   -83.34
640094 [C.CREEK7    115.00] AMP     7171.2   -84.75
640096 [CALAMS 7    115.00] AMP     3402.8   -75.02
640098 [CALAWAY7    115.00] AMP     3852.7   -74.87
640100 [CAMBRIG7    115.00] AMP     4148.3   -77.26
640101 [CAMBRIG8    69.000] AMP     2214.5   -82.54
640102 [CANADAY4    230.00] AMP     6224.0   -83.40
640103 [CANADAY7    115.00] AMP    13774.8   -81.89
640107 [CENCITY7    115.00] AMP     5067.5   -73.09
640131 [COLMB.W4    230.00] AMP     9632.8   -84.31
640133 [COLMBUS4    230.00] AMP    11177.2   -84.75
640139 [COOPER 3    345.00] AMP    26720.7   -85.93
640161 [ELMCRK_7    115.00] AMP     5904.0   -74.49
640167 [ENDERS 7    115.00] AMP     3737.2   -77.75
640168 [ENDERS 8    69.000] AMP     3019.7   -83.26
640178 [GENEVA 7    115.00] AMP    10002.7   -79.10
640183 [GENTLMN3    345.00] AMP    19229.6   -87.10
640184 [GENTLMN4    230.00] AMP    20371.2   -87.29
640194 [GOSPER 7    115.00] AMP     4331.9   -77.24
640196 [GOTHNBG7    115.00] AMP     4286.1   -74.95
640200 [GR ISLD4    230.00] AMP    16762.4   -84.98
640201 [GR ISLD7    115.00] AMP    23588.1   -84.18
640214 [HASTING4    230.00] AMP     7303.3   -84.58
640215 [HASTING7    115.00] AMP    19203.6   -82.72
640222 [HILDRTH7    115.00] AMP     4195.0   -75.92
640224 [HOLDREG7    115.00] AMP     6029.9   -78.69
640238 [JEFFREY7    115.00] AMP     5966.2   -78.97
640240 [JOHN.1 7    115.00] AMP     8234.3   -77.24
640242 [JOHN.2 7    115.00] AMP    12568.6   -80.32
640248 [KEAR.NE7    115.00] AMP     9059.3   -80.15
640250 [KEARNEY7    115.00] AMP    11618.5   -80.89
640252 [KEYSTON3    345.00] AMP    12281.2   -86.35
640253 [KEYSTON7    115.00] AMP    15523.2   -86.47
640255 [KINGSLY7    115.00] AMP     9307.2   -82.49
640261 [LOWELL 7    115.00] AMP     8010.2   -77.62
640265 [MALONEY7    115.00] AMP    11279.0   -80.01
640267 [MAXWELS7    115.00] AMP     6644.7   -81.35
640269 [MCCOOK 7    115.00] AMP     8742.8   -80.30
640270 [MCCOOK 8    69.000] AMP     4439.3   -84.86
640271 [MCCOOL 3    345.00] AMP    10360.5   -84.54
640272 [MCCOOL 7    115.00] AMP    14091.3   -84.06
640273 [MCCOOL     869.000] AMP     5464.6   -87.20
640275 [MINDEN 7    115.00] AMP     7096.9   -80.47
640277 [MOORE  3    345.00] AMP    21442.9   -85.29
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640278 [SHELDON7    115.00] AMP    32483.1   -85.36
640286 [N.PLATT4    230.00] AMP    13445.9   -84.73
640287 [N.PLATT7    115.00] AMP    18633.4   -84.70
640288 [N.PLATT8    69.000] AMP     4913.1   -87.38
640302 [OGALALA4    230.00] AMP     7871.8   -84.95
640304 [OGALALANPPD7115.00] AMP    15055.2   -85.03
640310 [ORLEANS7    115.00] AMP     2351.1   -70.63
640312 [PAULINE3    345.00] AMP     8068.4   -84.33
640313 [PAULINE7    115.00] AMP    16244.0   -81.77
640314 [PAULINE8    69.000] AMP     4713.6   -86.90
640325 [REDWILO3    345.00] AMP     6470.1   -84.59
640326 [REDWILO7    115.00] AMP    11379.3   -81.42
640330 [RIVERDL4    230.00] AMP     7036.8   -83.19
640331 [RIVERDL7    115.00] AMP    11888.3   -81.57
640353 [ST.LIB 7    115.00] AMP     9687.3   -76.43
640359 [STAPLETON  7115.00] AMP     4144.6   -82.08
640360 [STAPLETON  869.000] AMP     3167.1   -85.22
640365 [STOCKVL7    115.00] AMP     4505.9   -74.61
640366 [STOCKVL8    69.000] AMP     3262.3   -82.21
640370 [SUTHLND7    115.00] AMP     5429.9   -77.11
640374 [SWEET W3    345.00] AMP    11019.1   -85.24
640381 [THEDFRD7    115.00] AMP     9201.0   -85.46
640383 [TOWER  7    115.00] AMP     8751.6   -81.62
640413 [YORK SW7    115.00] AMP     8025.2   -80.34
640448 [HOLDREGE   869.000] AMP     5416.9   -82.92
640500 [THEDFORD3   345.00] AMP     5824.9   -85.05
640510 [HOLT.CO3    345.00] AMP     7480.0   -85.91
640530 [STEGALL7    115.00] AMP     7998.7   -86.70
641088 [HASTCTY7    115.00] AMP    19203.6   -82.72
641244 [ATHEY  7    115.00] AMP     3046.8   -77.22
642071 [SUB-D  7    115.00] AMP    17612.5   -81.04
642072 [SUB-E  7    115.00] AMP    17512.7   -83.52
650114 [NW68HOLDRG3 345.00] AMP    16555.5   -85.04
650189 [103&ROKEBY3 345.00] AMP    19819.0   -85.12
652532 [GR PRAIRIE 3345.00] AMP     6840.4   -86.12
652832 [GRPRAR1-LNX3345.00] AMP     6840.4   -86.12
653571 [GR ISLD3    345.00] AMP    12351.0   -85.03
653572 [SIDNEY 7    115.00] AMP     4198.7   -84.21
653871 [GR ISLD-LNX3345.00] AMP    12351.0   -85.03
659131 [LARAMIE3    345.00] AMP     7383.8   -87.77
659133 [SIDNEY 3    345.00] AMP     6672.4   -85.92
659134 [SIDNEY 4    230.00] AMP     6495.4   -85.64
659135 [STEGALL3    345.00] AMP     5086.0   -86.11
659206 [STGXFMR4    230.00] AMP     5550.4   -86.35
659210 [SIDXFMR4    230.00] AMP     7018.2   -86.17
659425 [SIDNEY1-LNX3345.00] AMP     6672.4   -85.92
659426 [SIDNEY2-LNX3345.00] AMP     6672.4   -85.92
659800 [GRANTNB7    115.00] AMP     6309.3   -79.05
659801 [OGALALA7    115.00] AMP    15055.2   -85.03
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659809 [ROSCOE 7    115.00] AMP     6378.2   -80.69
659810 [SPCREEK7    115.00] AMP     4370.5   -77.68
659817 [COLTON 7    115.00] AMP     3677.2   -81.01
659824 [MCONGHY7    115.00] AMP     5397.9   -77.27
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11.6.3 GEN-2018-075P 2018S

PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS MON, MAR 04 2019 14:11

2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL

MDWG 2018S WITH MMWG 2017S

OPTIONS USED:

- SET PRE-FAULT VOLTAGE ON ALL BUSES TO 1.00 PU AT 0 PHASE SHIFT ANGLE

- SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0

- SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT

- SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0

- SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES

- SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING ADMITTANCE=0.0 IN +/-/0 SEQUENCES

- SET LOAD=0.0 IN +/- SEQUENCES

- DC LINES AND FACTS DEVICES BLOCKED

- IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

THREE PHASE FAULT

X---------- BUS ----------X /I+/ AN(I+)

90750 [G18075-PSUB 345.00] AMP 7120.8 -85.60

90753 [G18075-SUB 115.00] AMP 29225.6 -86.23

90781 [G18-078-TAP 345.00] AMP 7450.5 -85.56

523961 [POTTER_CO 7345.00] AMP 11552.6 -86.04

524875 [OASIS 6230.00] AMP 7529.8 -81.81

524885 [SN_JUAN_TAP6230.00] AMP 4866.8 -83.10

524889 [SN_JUAN_WND6230.00] AMP 4652.3 -83.15

525543 [TOLK_TAP 6230.00] AMP 31540.5 -86.23

525549 [TOLK 7345.00] AMP 16481.0 -86.46

526460 [AMOCO_SS 6230.00] AMP 9626.8 -82.34

526934 [YOAKUM 3115.00] AMP 15871.0 -82.29

526935 [YOAKUM 6230.00] AMP 14269.7 -83.96

527009 [BRU_SUB 6230.00] AMP 12119.8 -83.95

527149 [MUSTANG 6230.00] AMP 14094.1 -85.35

527363 [HIGG 3115.00] AMP 10124.1 -74.43

527455 [RSWL_SLRCOL3115.00] AMP 7142.0 -83.75

527470 [CHVS_SLRCOL3115.00] AMP 6820.8 -83.63

527482 [CHAVES_CNTY3115.00] AMP 7216.4 -83.78

527483 [CHAVES_CNTY6230.00] AMP 4596.5 -82.68

527501 [URTON 3115.00] AMP 5954.9 -81.66

527509 [PRICE_TAP 3115.00] AMP 5490.5 -81.75

527546 [SAMSON 3115.00] AMP 5607.0 -80.97

527564 [ROSWLL_INT 3115.00] AMP 5872.4 -81.21

527597 [TWEEDY 3115.00] AMP 5402.3 -80.55

527654 [RSVLT_CC_W 7345.00] AMP 7686.3 -85.10

527655 [RSVLT_CC_E 7345.00] AMP 8723.8 -85.23

527656 [CROSSROADS 7345.00] AMP 9932.2 -85.39

527707 [ARTESIA 3115.00] AMP 7133.2 -79.48

527710 [EAGLE_CREEK269.000] AMP 2345.7 -86.41

527711 [EAGLE_CREEK3115.00] AMP 7792.4 -79.74

527715 [NAVAJO_2TP 3115.00] AMP 7407.2 -79.43

527736 [NAVAJO_5TP 3115.00] AMP 7362.1 -79.39

527786 [ATOKA 3115.00] AMP 7463.9 -79.34

527793 [EDDY_STH 3115.00] AMP 12456.0 -84.04

527798 [EDDY_NTH 3115.00] AMP 12456.0 -84.04

527799 [EDDY_NORTH 6230.00] AMP 10079.1 -84.91

527802 [EDDY_CNTY 7345.00] AMP 8343.4 -85.59

527809 [CV-8_MILE 3115.00] AMP 5575.0 -84.56

527821 [CV-DAYTON +3115.00] AMP 7362.4 -79.22

527822 [CV-TURKYTRK3115.00] AMP 3515.4 -81.03

527864 [CUNNINHAM 3115.00] AMP 27134.8 -83.61

527865 [CUNNIGHM_N 6230.00] AMP 17042.9 -86.60

527867 [CUNNIGHM_S 6230.00] AMP 17042.9 -86.60

527891 [HOBBS_INT 3115.00] AMP 30781.7 -85.44

527894 [HOBBS_INT 6230.00] AMP 18311.7 -86.90

527896 [HOBBS_INT 7345.00] AMP 8984.5 -86.94

527929 [PCA 269.000] AMP 6400.0 -83.12

527930 [PCA 3115.00] AMP 11898.6 -79.55

527935 [CV-SKELLY 3115.00] AMP 3272.7 -80.40

527938 [CV-MALJAMAR3115.00] AMP 2892.6 -80.44

527943 [CV-LUSK 269.000] AMP 2262.7 -64.77

527947 [CV-LUSK 3115.00] AMP 3519.4 -80.38

527948 [CV-LUSK_TP 3115.00] AMP 4274.5 -80.30

527952 [LIVSTNRIDGE269.000] AMP 2058.8 -67.81

527953 [LIVSTNRIDGE3115.00] AMP 8060.0 -77.88

527955 [SAGE_BRUSH 3115.00] AMP 5343.5 -77.54

527961 [POTASH_JCT 269.000] AMP 9153.7 -86.43

527962 [POTASH_JCT 3115.00] AMP 16687.1 -83.95

527963 [POTASH_JCT 6230.00] AMP 7584.4 -84.39

527965 [KIOWA 7345.00] AMP 9741.9 -86.23

527980 [DUVAL_#1 269.000] AMP 5920.4 -77.75

527989 [NMPOTASH 269.000] AMP 2573.1 -69.12

527996 [KERMAC 269.000] AMP 2996.6 -70.20

527999 [INTREPDW_TP3115.00] AMP 13814.3 -81.76

528000 [INTREPIDWST3115.00] AMP 11650.3 -80.38

528009 [WIPP 3115.00] AMP 7553.7 -77.46

528016 [SAND_DUNES 3115.00] AMP 7459.1 -77.40

528018 [RED_BLUFF 3115.00] AMP 9702.1 -79.34

528019 [NEWSUB1_7 345.00] AMP 7120.8 -85.60

528020 [BOPCO_PKRLK3115.00] AMP 13343.3 -85.08

528022 [MISSCHEM#2 269.000] AMP 6940.2 -83.27

528025 [RDRUNNER 3115.00] AMP 11094.5 -83.59

528027 [RDRUNNER 7345.00] AMP 7039.5 -85.52

528029 [IMC_#2 269.000] AMP 4345.2 -79.60

528035 [IMC_#1_TP 3115.00] AMP 9868.5 -78.87

528037 [IMC_#1 3115.00] AMP 8787.6 -78.26

528040 [BATTLE_AXE 3115.00] AMP 3039.2 -78.44

528043 [UNITEDSALT 269.000] AMP 4165.7 -79.35

528070 [CV-AZMESA 3115.00] AMP 7704.8 -79.11

528076 [CV-WALTCYN 3115.00] AMP 4632.2 -76.50

528093 [7-RIVERS 269.000] AMP 2413.9 -86.38

528094 [7-RIVERS 3115.00] AMP 8675.8 -81.56

528095 [7-RIVERS 6230.00] AMP 6629.8 -83.43

528109 [CV-LAKEWOOD3115.00] AMP 6675.2 -78.82

528132 [OCOTILLO 3115.00] AMP 6337.7 -72.87

528137 [N_CANAL 3115.00] AMP 9012.8 -78.32

528145 [NATPOT_TP 269.000] AMP 9102.9 -86.34

528151 [FIESTA 3115.00] AMP 10179.9 -78.32

528159 [CARLSBAD 269.000] AMP 4924.9 -85.57

528160 [CARLSBAD 3115.00] AMP 11795.8 -79.12

528178 [PECOS 3115.00] AMP 12478.3 -80.32

528179 [PECOS 6230.00] AMP 6853.1 -83.79

528182 [NORTH_LOVNG3115.00] AMP 10490.4 -85.01

528185 [N_LOVING 7345.00] AMP 7301.2 -85.64

528190 [S_LOVING_TP269.000] AMP 3015.7 -80.48

528197 [CB_WTRFLDTP269.000] AMP 2644.4 -75.82

528218 [SLOV&NAVMAL269.000] AMP 1771.4 -68.10

528222 [CHINA_DRAW 3115.00] AMP 9904.0 -84.90

528223 [CHINA_DRAW 7345.00] AMP 6680.2 -85.49

528226 [HOPI_SUB 3115.00] AMP 7152.3 -79.78

528228 [WOOD_DRAW 3115.00] AMP 7654.9 -79.77

528230 [AGAVE_RHILL3115.00] AMP 10569.3 -82.86

528232 [OCHOA 3115.00] AMP 10343.3 -82.55

528235 [WOLFCAMP_TP3115.00] AMP 11852.0 -83.03

528236 [WOLFCAMP 3115.00] AMP 10965.7 -82.87

528239 [PNDEROSATP 3115.00] AMP 7327.3 -78.46

528333 [LE-WEST_SUB3115.00] AMP 8354.8 -81.30

528334 [LE-NRTH_INT3115.00] AMP 8277.6 -81.21

528348 [BUCKEYE_TP 3115.00] AMP 8185.4 -81.57

528353 [MADDOXG23 3115.00] AMP 25680.9 -84.47

528355 [MADDOX 3115.00] AMP 25680.9 -84.47

528392 [PEARLE 3115.00] AMP 6333.7 -73.63

528394 [QUAHADA 3115.00] AMP 8268.2 -76.53

528396 [XTO_LOAD#4 115.00] AMP 9075.9 -77.85

528399 [LEA_NATIONL3115.00] AMP 6935.7 -75.12

528422 [DCP_ZIA TP 3115.00] AMP 7144.3 -75.71

528433 [BENSING 3115.00] AMP 7960.8 -73.44

528435 [MILLEN 3115.00] AMP 11443.8 -73.86

528442 [NE_HOBBS 3115.00] AMP 11739.7 -74.63

528463 [SANGER_SW 3115.00] AMP 15606.2 -80.10

528491 [MONUMENT 3115.00] AMP 15226.6 -81.83

528568 [MONUMNT_TP 3115.00] AMP 9969.4 -76.47

528602 [ANDREWS 3115.00] AMP 12812.7 -84.03

528603 [NA_ENRICH 3115.00] AMP 12154.3 -82.69

528604 [ANDREWS 6345.00] AMP 6471.8 -85.44

528610 [GAINES_GEN 6230.00] AMP 9057.7 -85.97

528611 [GAINESGENTP6345.00] AMP 7085.6 -85.89

560022 [CRAWFISH_DR 345.00] AMP 22816.8 -86.35

560059 [G1579&G1580T230.00] AMP 9133.8 -83.33

562480 [G13-027-TAP 230.00] AMP 9467.4 -82.97

583960 [G14034G14035115.00] AMP 6786.0 -83.59

584940 [GEN-2015-056345.00] AMP 7956.7 -85.13

585160 [G1579&G1580 230.00] AMP 8671.0 -83.21

587110 [GEN-2016-015345.00] AMP 6187.0 -85.02

587420 [GEN-2016-062345.00] AMP 5071.6 -85.18

587470 [GEN-2016-069115.00] AMP 6964.2 -83.74

587670 [GEN-2015-099115.00] AMP 16593.1 -80.67

587990 [GEN-2016-121115.00] AMP 10402.7 -82.44

588000 [GEN-2016-123345.00] AMP 9751.0 -85.37

588350 [GEN-2016-171230.00] AMP 8904.4 -83.28

588430 [GEN-2016-169345.00] AMP 8752.3 -86.75

599960 [EPTNP-D6 230.00] AMP 10079.1 -84.91

11.6.4 GEN-2018-075P 2026S

PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS MON, MAR 04 2019 14:11

2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL

MDWG 2026S WITH MMWG 2026S

OPTIONS USED:

- SET PRE-FAULT VOLTAGE ON ALL BUSES TO 1.00 PU AT 0 PHASE SHIFT ANGLE
- SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
- SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
- SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
- SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES

- SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING ADMITTANCE=0.0 IN +/-/0 SEQUENCES

- SET LOAD=0.0 IN +/- SEQUENCES

- DC LINES AND FACTS DEVICES BLOCKED

- IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

THREE PHASE FAULT

X---------- BUS ----------X /I+/ AN(I+)

90750 [G18075-PSUB 345.00] AMP 7354.5 -85.54

90753 [G18075-SUB 115.00] AMP 30956.9 -86.06

90781 [G18-078-TAP 345.00] AMP 7472.0 -85.54

511456 [O.K.U.-7 345.00] AMP 5566.0 -84.56

515458 [BORDER 7345.00] AMP 12592.3 -85.75

523961 [POTTER_CO 7345.00] AMP 11441.3 -86.00

524875 [OASIS 6230.00] AMP 7535.1 -81.81

524885 [SN_JUAN_TAP6230.00] AMP 4863.8 -83.11

524889 [SN_JUAN_WND6230.00] AMP 4649.7 -83.16

525524 [TOLK_EAST 6230.00] AMP 31018.0 -86.15

525531 [TOLK_WEST 6230.00] AMP 31018.0 -86.15

525543 [TOLK_TAP 6230.00] AMP 31018.0 -86.15

525549 [TOLK 7345.00] AMP 16386.1 -86.42

525828 [TUCO_INT 3115.00] AMP 21383.1 -83.62

525830 [TUCO_INT 6230.00] AMP 30777.5 -85.94

525832 [TUCO_INT 7345.00] AMP 23933.5 -86.34

525840 [ANTELOPE_1 6230.00] AMP 30428.1 -85.94

525850 [ELK_CT1 345.00] AMP 23476.6 -86.30

525957 [HALE_WNDCL16230.00] AMP 10033.4 -84.28

526161 [CARLISLE 6230.00] AMP 14547.7 -83.80

526337 [JONES 6230.00] AMP 22086.1 -85.95

526435 [SUNDOWN 6230.00] AMP 11293.1 -82.45

526460 [AMOCO_SS 6230.00] AMP 9887.4 -82.42

526784 [AMOCOWASSON6230.00] AMP 14109.8 -84.89

526792 [PRENTICE 3115.00] AMP 5910.1 -75.52

526928 [PLAINS_INT 3115.00] AMP 9838.2 -78.12

526934 [YOAKUM 3115.00] AMP 16876.5 -82.87

526935 [YOAKUM 6230.00] AMP 18208.3 -85.07

526936 [YOAKUM_345 345.00] AMP 9935.8 -86.23

527009 [BRU_SUB 6230.00] AMP 14266.7 -84.51

527010 [OXYBRU 6230.00] AMP 14145.2 -84.49

527041 [ARCO_TP 3115.00] AMP 13074.2 -78.94

527146 [MUSTANG 3115.00] AMP 22483.9 -84.20

527149 [MUSTANG 6230.00] AMP 15893.7 -85.66

527151 [GS-MUSTANG 6230.00] AMP 15893.7 -85.66

527194 [LG-PLSHILL 3115.00] AMP 7543.6 -76.21

527276 [SEMINOLE 6230.00] AMP 7303.7 -82.58

527363 [HIGG 3115.00] AMP 10158.0 -74.43

527455 [RSWL_SLRCOL3115.00] AMP 7140.6 -83.75

527470 [CHVS_SLRCOL3115.00] AMP 6819.5 -83.63

527482 [CHAVES_CNTY3115.00] AMP 7215.0 -83.78

527483 [CHAVES_CNTY6230.00] AMP 4594.8 -82.68

527501 [URTON 3115.00] AMP 5958.9 -81.66

527509 [PRICE_TAP 3115.00] AMP 5489.6 -81.75

527546 [SAMSON 3115.00] AMP 5608.4 -80.98

527564 [ROSWLL_INT 3115.00] AMP 5877.5 -81.22

527597 [TWEEDY 3115.00] AMP 5406.3 -80.56

527654 [RSVLT_CC_W 7345.00] AMP 7674.0 -85.11

527655 [RSVLT_CC_E 7345.00] AMP 8707.3 -85.23

527656 [CROSSROADS 7345.00] AMP 9909.8 -85.39

527707 [ARTESIA 3115.00] AMP 7139.4 -79.46

527710 [EAGLE_CREEK269.000] AMP 2346.1 -86.41

527711 [EAGLE_CREEK3115.00] AMP 7799.8 -79.73

527715 [NAVAJO_2TP 3115.00] AMP 7413.9 -79.42

527736 [NAVAJO_5TP 3115.00] AMP 7368.7 -79.38

527786 [ATOKA 3115.00] AMP 7470.7 -79.32

527793 [EDDY_STH 3115.00] AMP 12475.1 -84.03

527798 [EDDY_NTH 3115.00] AMP 12475.1 -84.03

527799 [EDDY_NORTH 6230.00] AMP 10100.4 -84.91

527802 [EDDY_CNTY 7345.00] AMP 8500.3 -85.50

527809 [CV-8_MILE 3115.00] AMP 5578.8 -84.56

527821 [CV-DAYTON +3115.00] AMP 7369.1 -79.21

527822 [CV-TURKYTRK3115.00] AMP 3516.9 -81.02

527864 [CUNNINHAM 3115.00] AMP 26982.7 -83.58

527865 [CUNNIGHM_N 6230.00] AMP 15292.7 -86.14

527867 [CUNNIGHM_S 6230.00] AMP 15292.7 -86.14

527891 [HOBBS_INT 3115.00] AMP 30592.8 -85.38

527894 [HOBBS_INT 6230.00] AMP 17524.3 -86.86

527896 [HOBBS_INT 7345.00] AMP 11339.1 -86.66

527929 [PCA 269.000] AMP 6416.9 -83.12

527930 [PCA 3115.00] AMP 11973.8 -79.51

527935 [CV-SKELLY 3115.00] AMP 3278.4 -80.39

527938 [CV-MALJAMAR3115.00] AMP 2897.0 -80.43

527943 [CV-LUSK 269.000] AMP 2264.7 -64.75

527947 [CV-LUSK 3115.00] AMP 3526.0 -80.37

527948 [CV-LUSK_TP 3115.00] AMP 4284.2 -80.29

527953 [LIVSTNRIDGE3115.00] AMP 8183.2 -78.33

527955 [SAGE_BRUSH 3115.00] AMP 5406.6 -78.13

527961 [POTASH_JCT 269.000] AMP 9190.3 -86.44

527962 [POTASH_JCT 3115.00] AMP 16903.8 -83.96

527963 [POTASH_JCT 6230.00] AMP 7528.3 -84.41

527965 [KIOWA 7345.00] AMP 10319.0 -86.06

527980 [DUVAL_#1 269.000] AMP 5935.6 -77.73

527989 [NMPOTASH 269.000] AMP 2575.9 -69.11

527996 [KERMAC 269.000] AMP 3000.4 -70.18

527999 [INTREPDW_TP3115.00] AMP 14048.5 -82.33

528000 [INTREPIDWST3115.00] AMP 11818.9 -80.84

528009 [WIPP 3115.00] AMP 7657.6 -77.78

528016 [SAND_DUNES 3115.00] AMP 7553.4 -77.55

528018 [RED_BLUFF 3115.00] AMP 9854.0 -79.39

528019 [NEWSUB1_7 345.00] AMP 7354.5 -85.54

528020 [BOPCO_PKRLK3115.00] AMP 13618.2 -85.07

528022 [MISSCHEM#2 269.000] AMP 6961.3 -83.27

528025 [RDRUNNER 3115.00] AMP 11313.6 -83.84

528027 [RDRUNNER 7345.00] AMP 7277.7 -85.47

528029 [IMC_#2 269.000] AMP 4353.4 -79.59

528035 [IMC_#1_TP 3115.00] AMP 10090.4 -79.99

528037 [IMC_#1 3115.00] AMP 8965.0 -79.25

528040 [BATTLE_AXE 3115.00] AMP 3055.6 -78.48

528043 [UNITEDSALT 269.000] AMP 4173.2 -79.34

528070 [CV-AZMESA 3115.00] AMP 7715.5 -79.09

528076 [CV-WALTCYN 3115.00] AMP 4636.0 -76.48

528093 [7-RIVERS 269.000] AMP 2414.3 -86.38

528094 [7-RIVERS 3115.00] AMP 8685.3 -81.54

528095 [7-RIVERS 6230.00] AMP 6628.9 -83.43

528109 [CV-LAKEWOOD3115.00] AMP 6680.6 -78.80

528132 [OCOTILLO 3115.00] AMP 6350.4 -72.82

528137 [N_CANAL 3115.00] AMP 9039.3 -78.28

528145 [NATPOT_TP 269.000] AMP 9139.0 -86.36

528151 [FIESTA 3115.00] AMP 10217.8 -78.27

528159 [CARLSBAD 269.000] AMP 4929.6 -85.56

528160 [CARLSBAD 3115.00] AMP 11846.9 -79.06

528178 [PECOS 3115.00] AMP 12529.7 -80.26

528179 [PECOS 6230.00] AMP 6836.2 -83.80

528182 [NORTH_LOVNG3115.00] AMP 10650.8 -84.98

528185 [N_LOVING 7345.00] AMP 7585.3 -85.52

528190 [S_LOVING_TP269.000] AMP 3017.4 -80.47

528192 [SOUTH_LOVNG3115.00] AMP 7745.6 -82.61

528197 [CB_WTRFLDTP269.000] AMP 2645.7 -75.81

528218 [NAVAJOMALGA269.000] AMP 1771.9 -68.09

528222 [CHINA_DRAW 3115.00] AMP 10058.1 -84.87

528223 [CHINA_DRAW 7345.00] AMP 6899.6 -85.40

528226 [HOPI_SUB 3115.00] AMP 7193.7 -79.73

528228 [WOOD_DRAW 3115.00] AMP 7744.5 -79.69

528230 [AGAVE_RHILL3115.00] AMP 10771.6 -83.14

528232 [OCHOA 3115.00] AMP 10538.7 -82.84

528235 [WOLFCAMP_TP3115.00] AMP 12069.3 -83.00

528236 [WOLFCAMP 3115.00] AMP 11151.4 -82.84

528239 [PNDEROSATP 3115.00] AMP 7472.2 -79.39

528246 [YESO_HILLS 3115.00] AMP 2981.7 -78.85

528333 [LE-WEST_SUB3115.00] AMP 8349.8 -81.29

528334 [LE-NRTH_INT3115.00] AMP 8273.3 -81.20

528348 [BUCKEYE_TP 3115.00] AMP 8171.2 -81.57

528353 [MADDOXG23 3115.00] AMP 25768.7 -84.48

528355 [MADDOX 3115.00] AMP 25768.7 -84.48

528392 [PEARLE 3115.00] AMP 6337.2 -73.61

528394 [QUAHADA 3115.00] AMP 8279.5 -76.51

528396 [XTO_LOAD#4 115.00] AMP 9104.3 -77.82

528399 [LEA_NATIONL3115.00] AMP 6942.4 -75.10

528422 [DCP_ZIA TP 3115.00] AMP 7152.7 -75.69

528433 [BENSING 3115.00] AMP 7954.6 -73.44

528435 [MILLEN 3115.00] AMP 11435.1 -73.86

528442 [NE_HOBBS 3115.00] AMP 11734.8 -74.63

528463 [SANGER_SW 3115.00] AMP 15626.6 -80.10

528491 [MONUMENT 3115.00] AMP 15272.7 -81.82

528568 [MONUMNT_TP 3115.00] AMP 10145.1 -78.57

528602 [ANDREWS 3115.00] AMP 13469.6 -84.32

528603 [NA_ENRICH 3115.00] AMP 12676.7 -83.06

528604 [ANDREWS 6345.00] AMP 7207.3 -85.20

528610 [GAINES_GEN 6230.00] AMP 9989.1 -85.72

528611 [GAINESGENTP6345.00] AMP 8044.2 -85.61

560021 [CRAWFISH_DR2230.00] AMP 25430.6 -85.41

560022 [CRAWFISH_DR 345.00] AMP 24496.0 -86.37

560059 [G1579&G1580T230.00] AMP 9180.7 -83.40

562480 [G13-027-TAP 230.00] AMP 9496.9 -82.98

583840 [GEN-2013-027230.00] AMP 8996.6 -83.10

583960 [G14034G14035115.00] AMP 6784.8 -83.59

584940 [GEN-2015-056345.00] AMP 7942.5 -85.13

585060 [GEN-2015-068345.00] AMP 16238.1 -85.78

585160 [G1579&G1580 230.00] AMP 8713.2 -83.27

587110 [GEN-2016-015345.00] AMP 6855.6 -84.75

587420 [GEN-2016-062345.00] AMP 5492.6 -84.97

587470 [GEN-2016-069115.00] AMP 6962.9 -83.74

587670 [GEN-2015-099115.00] AMP 16629.8 -80.66

587964 [G16-120-TAP 345.00] AMP 8593.2 -85.25

587990 [GEN-2016-121115.00] AMP 10596.0 -82.64

588000 [GEN-2016-123345.00] AMP 9729.7 -85.37

588350 [GEN-2016-171230.00] AMP 8948.9 -83.34

588430 [GEN-2016-169345.00] AMP 10971.4 -86.43

599960 [EPTNP-D6 230.00] AMP 10100.4 -84.91

11.6.5 GEN-2018-075S 2018S

PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS MON, MAR 04 2019 14:20
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2018S WITH MMWG 2017S

OPTIONS USED:
- SET PRE-FAULT VOLTAGE ON ALL BUSES TO 1.00 PU AT 0 PHASE SHIFT ANGLE
- SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
- SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
- SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
- SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
- SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING ADMITTANCE=0.0 IN +/-/0 SEQUENCES
- SET LOAD=0.0 IN +/- SEQUENCES
- DC LINES AND FACTS DEVICES BLOCKED
- IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

THREE PHASE FAULT
X---------- BUS ----------X /I+/ AN(I+)
90753 [G18075-SUB 115.00] AMP 28679.7 -86.22
90757 [G18075-SSUB 345.00] AMP 5396.0 -85.71
90781 [G18-078-TAP 345.00] AMP 7432.1 -85.56
527799 [EDDY_NORTH 6230.00] AMP 10037.6 -84.89
527802 [EDDY_CNTY 7345.00] AMP 8276.7 -85.59
527894 [HOBBS_INT 6230.00] AMP 18265.0 -86.89
527896 [HOBBS_INT 7345.00] AMP 8934.2 -86.93
527930 [PCA 3115.00] AMP 11884.3 -79.51
527953 [LIVSTNRIDGE3115.00] AMP 8153.0 -77.76
527961 [POTASH_JCT 269.000] AMP 9149.1 -86.41
527962 [POTASH_JCT 3115.00] AMP 16660.9 -83.88
527963 [POTASH_JCT 6230.00] AMP 7570.8 -84.36
527965 [KIOWA 7345.00] AMP 9559.9 -86.22
527999 [INTREPDW_TP3115.00] AMP 13817.5 -81.70
528009 [WIPP 3115.00] AMP 7665.3 -77.32
528016 [SAND_DUNES 3115.00] AMP 7638.6 -77.21
528018 [RED_BLUFF 3115.00] AMP 10218.5 -79.08
528019 [NEWSUB1_7 345.00] AMP 6772.1 -85.63
528020 [BOPCO_PKRLK3115.00] AMP 16188.0 -85.71
528025 [RDRUNNER 3115.00] AMP 11165.2 -83.37
528027 [RDRUNNER 7345.00] AMP 6772.4 -85.54
528040 [BATTLE_AXE 3115.00] AMP 3044.1 -78.37
528160 [CARLSBAD 3115.00] AMP 11772.1 -79.10

528178 [PECOS 3115.00] AMP 12450.0 -80.30
528182 [NORTH_LOVNG3115.00] AMP 10428.0 -84.95
528185 [N_LOVING 7345.00] AMP 7152.7 -85.62
528222 [CHINA_DRAW 3115.00] AMP 9958.0 -84.75
528223 [CHINA_DRAW 7345.00] AMP 6496.6 -85.49
528226 [HOPI_SUB 3115.00] AMP 7135.5 -79.77
528228 [WOOD_DRAW 3115.00] AMP 8220.4 -79.46
528230 [AGAVE_RHILL3115.00] AMP 10631.2 -82.66
528232 [OCHOA 3115.00] AMP 10401.5 -82.35
528235 [WOLFCAMP_TP3115.00] AMP 13780.6 -83.14
528236 [WOLFCAMP 3115.00] AMP 12596.7 -82.95
528611 [GAINESGENTP6345.00] AMP 7064.3 -85.88
587990 [GEN-2016-121115.00] AMP 10464.1 -82.23
588430 [GEN-2016-169345.00] AMP 8704.5 -86.74

11.6.6 GEN-2018-075S 2026S

PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS MON, MAR 04 2019 14:20

2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL

MDWG 2026S WITH MMWG 2026S

OPTIONS USED:

- SET PRE-FAULT VOLTAGE ON ALL BUSES TO 1.00 PU AT 0 PHASE SHIFT ANGLE

- SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0

- SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT

- SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0

- SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES

- SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING ADMITTANCE=0.0 IN +/-/0 SEQUENCES

- SET LOAD=0.0 IN +/- SEQUENCES

- DC LINES AND FACTS DEVICES BLOCKED

- IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

THREE PHASE FAULT

X---------- BUS ----------X /I+/ AN(I+)

90753 [G18075-SUB 115.00] AMP 30407.6 -86.05

90757 [G18075-SSUB 345.00] AMP 5504.9 -85.69

90781 [G18-078-TAP 345.00] AMP 7455.1 -85.54

526936 [YOAKUM_345 345.00] AMP 9922.4 -86.23

527799 [EDDY_NORTH 6230.00] AMP 10062.5 -84.89

527802 [EDDY_CNTY 7345.00] AMP 8437.7 -85.49

527894 [HOBBS_INT 6230.00] AMP 17486.5 -86.84

527896 [HOBBS_INT 7345.00] AMP 11286.6 -86.65

527930 [PCA 3115.00] AMP 11962.3 -79.48

527953 [LIVSTNRIDGE3115.00] AMP 8275.6 -78.20

527961 [POTASH_JCT 269.000] AMP 9186.8 -86.42

527962 [POTASH_JCT 3115.00] AMP 16883.9 -83.90

527963 [POTASH_JCT 6230.00] AMP 7516.6 -84.39

527965 [KIOWA 7345.00] AMP 10135.9 -86.05

527999 [INTREPDW_TP3115.00] AMP 14055.1 -82.27

528009 [WIPP 3115.00] AMP 7768.3 -77.63

528016 [SAND_DUNES 3115.00] AMP 7731.7 -77.36

528018 [RED_BLUFF 3115.00] AMP 10371.9 -79.12

528019 [NEWSUB1_7 345.00] AMP 7000.7 -85.56

528020 [BOPCO_PKRLK3115.00] AMP 16514.6 -85.69

528025 [RDRUNNER 3115.00] AMP 11388.1 -83.62

528027 [RDRUNNER 7345.00] AMP 7008.1 -85.48

528040 [BATTLE_AXE 3115.00] AMP 3060.7 -78.41

528160 [CARLSBAD 3115.00] AMP 11826.0 -79.04

528178 [PECOS   3115.00] AMP   12504.6   -80.24

528182 [NORTH_LOVNG3115.00] AMP   10592.7   -84.92

528185 [N_LOVING   7345.00] AMP   7438.0   -85.50

528192 [SOUTH_LOVNG3115.00] AMP   7714.6   -82.57

528222 [CHINA_DRAW 3115.00] AMP   10115.6   -84.72

528223 [CHINA_DRAW 7345.00] AMP   6716.2   -85.40

528226 [HOPI_SUB   3115.00] AMP   7178.5   -79.71

528228 [WOOD_DRAW 3115.00] AMP   8309.4   -79.38

528230 [AGAVE_RHILL3115.00] AMP   10836.7   -82.93

528232 [OCHOA   3115.00] AMP   10600.0   -82.64

528235 [WOLFCAMP_TP3115.00] AMP   14021.9   -83.10

528236 [WOLFCAMP   3115.00] AMP   12798.1   -82.91

528246 [YESO_HILLS 3115.00] AMP   2986.5   -78.80

528611 [GAINESGENTP6345.00] AMP   8026.6   -85.60

587990 [GEN-2016-121115.00] AMP   10660.5   -82.43

588430 [GEN-2016-169345.00] AMP   10922.3   -86.42

11.6.7 GEN-2018-075T 2018S

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                              PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:26
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2018S WITH MMWG 2017S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
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    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                    THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 90753 [G18075-SUB  115.00] AMP    25442.4   -85.78
 90781 [G18-078-TAP 345.00] AMP     7297.9   -85.54
523961 [POTTER_CO  7345.00] AMP    11551.4   -86.04
524875 [OASIS      6230.00] AMP     7522.9   -81.81
524885 [SN_JUAN_TAP6230.00] AMP     4854.3   -83.11
524889 [SN_JUAN_WND6230.00] AMP     4641.4   -83.16
525543 [TOLK_TAP   6230.00] AMP    31507.4   -86.23
525549 [TOLK       7345.00] AMP    16455.4   -86.46
526460 [AMOCO_SS   6230.00] AMP     9621.4   -82.34
526934 [YOAKUM     3115.00] AMP    15853.0   -82.30
526935 [YOAKUM     6230.00] AMP    14233.1   -83.98
527009 [BRU_SUB    6230.00] AMP    12096.2   -83.97
527149 [MUSTANG    6230.00] AMP    14068.6   -85.37
527363 [HIGG       3115.00] AMP    10102.4   -74.48
527455 [RSWL_SLRCOL3115.00] AMP     7092.2   -83.76
527470 [CHVS_SLRCOL3115.00] AMP     6775.6   -83.65
527482 [CHAVES_CNTY3115.00] AMP     7165.6   -83.79
527483 [CHAVES_CNTY6230.00] AMP     4556.0   -82.70
527501 [URTON      3115.00] AMP     5919.4   -81.68
527509 [PRICE_TAP  3115.00] AMP     5460.5   -81.77
527546 [SAMSON     3115.00] AMP     5574.6   -81.00
527564 [ROSWLL_INT 3115.00] AMP     5836.0   -81.23
527597 [TWEEDY     3115.00] AMP     5370.1   -80.57
527654 [RSVLT_CC_W 7345.00] AMP     7652.9   -85.11
527655 [RSVLT_CC_E 7345.00] AMP     8679.0   -85.23
527656 [CROSSROADS 7345.00] AMP     9871.7   -85.39
527707 [ARTESIA    3115.00] AMP     7024.6   -79.54
527710 [EAGLE_CREEK269.000] AMP     2338.6   -86.40
527711 [EAGLE_CREEK3115.00] AMP     7662.9   -79.80
527715 [NAVAJO_2TP 3115.00] AMP     7290.2   -79.49
527736 [NAVAJO_5TP 3115.00] AMP     7246.5   -79.46
527786 [ATOKA      3115.00] AMP     7343.9   -79.41
527793 [EDDY_STH   3115.00] AMP    12135.6   -84.03
527798 [EDDY_NTH   3115.00] AMP    12135.6   -84.03
527799 [EDDY_NORTH 6230.00] AMP     9677.1   -84.82
527802 [EDDY_CNTY  7345.00] AMP     7811.4   -85.45
527809 [CV-8_MILE  3115.00] AMP     5509.9   -84.55
527821 [CV-DAYTON +3115.00] AMP     7246.0   -79.29
527822 [CV-TURKYTRK3115.00] AMP     3489.5   -81.04
527864 [CUNNINHAM  3115.00] AMP    26723.7   -83.71
527865 [CUNNIGHM_N 6230.00] AMP    16570.8   -86.61
527867 [CUNNIGHM_S 6230.00] AMP    16570.8   -86.61
527891 [HOBBS_INT  3115.00] AMP    30312.0   -85.53
527894 [HOBBS_INT  6230.00] AMP    17761.9   -86.89
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527896 [HOBBS_INT  7345.00] AMP     8502.6   -86.89
527929 [PCA        269.000] AMP     6323.2   -83.11
527930 [PCA        3115.00] AMP    11514.1   -79.64
527935 [CV-SKELLY  3115.00] AMP     3242.9   -80.42
527938 [CV-MALJAMAR3115.00] AMP     2869.3   -80.46
527943 [CV-LUSK    269.000] AMP     2253.5   -64.84
527947 [CV-LUSK    3115.00] AMP     3485.0   -80.40
527948 [CV-LUSK_TP 3115.00] AMP     4223.8   -80.33
527952 [LIVSTNRIDGE269.000] AMP     2050.8   -67.87
527953 [LIVSTNRIDGE3115.00] AMP     7747.3   -78.02
527955 [SAGE_BRUSH 3115.00] AMP     5239.0   -77.64
527961 [POTASH_JCT 269.000] AMP     8992.9   -86.35
527962 [POTASH_JCT 3115.00] AMP    15800.9   -83.83
527963 [POTASH_JCT 6230.00] AMP     7350.0   -84.31
527965 [KIOWA      7345.00] AMP     8480.8   -85.78
527980 [DUVAL_#1   269.000] AMP     5852.6   -77.79
527989 [NMPOTASH   269.000] AMP     2560.5   -69.18
527996 [KERMAC     269.000] AMP     2979.4   -70.27
527999 [INTREPDW_TP3115.00] AMP    13176.0   -81.75
528000 [INTREPIDWST3115.00] AMP    11193.1   -80.43
528009 [WIPP       3115.00] AMP     7247.7   -77.61
528016 [SAND_DUNES 3115.00] AMP     7094.4   -77.55
528018 [RED_BLUFF  3115.00] AMP     8931.8   -79.36
528019 [NEWSUB1_7   345.00] AMP     5578.4   -84.62
528020 [BOPCO_PKRLK3115.00] AMP    11561.0   -84.34
528022 [MISSCHEM#2 269.000] AMP     6847.1   -83.25
528025 [RDRUNNER   3115.00] AMP    10108.8   -83.16
528027 [RDRUNNER   7345.00] AMP     5686.3   -84.69
528029 [IMC_#2     269.000] AMP     4308.5   -79.62
528035 [IMC_#1_TP  3115.00] AMP     9499.4   -78.96
528037 [IMC_#1     3115.00] AMP     8493.8   -78.36
528040 [BATTLE_AXE 3115.00] AMP     2959.9   -78.44
528043 [UNITEDSALT 269.000] AMP     4132.0   -79.37
528070 [CV-AZMESA  3115.00] AMP     7562.4   -79.19
528076 [CV-WALTCYN 3115.00] AMP     4580.6   -76.58
528093 [7-RIVERS   269.000] AMP     2405.8   -86.37
528094 [7-RIVERS   3115.00] AMP     8504.4   -81.60
528095 [7-RIVERS   6230.00] AMP     6443.4   -83.41
528109 [CV-LAKEWOOD3115.00] AMP     6576.3   -78.89
528132 [OCOTILLO   3115.00] AMP     6229.7   -73.05
528137 [N_CANAL    3115.00] AMP     8793.1   -78.45
528145 [NATPOT_TP  269.000] AMP     8943.8   -86.26
528151 [FIESTA     3115.00] AMP     9898.6   -78.46
528159 [CARLSBAD   269.000] AMP     4890.2   -85.56
528160 [CARLSBAD   3115.00] AMP    11419.4   -79.25
528178 [PECOS      3115.00] AMP    12060.2   -80.42
528179 [PECOS      6230.00] AMP     6650.2   -83.73
528182 [NORTH_LOVNG3115.00] AMP     9803.7   -84.77
528185 [N_LOVING   7345.00] AMP     6301.7   -85.13
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528190 [S_LOVING_TP269.000] AMP     3002.7   -80.50
528197 [CB_WTRFLDTP269.000] AMP     2634.5   -75.85
528218 [SLOV&NAVMAL269.000] AMP     1767.1   -68.14
528222 [CHINA_DRAW 3115.00] AMP     9048.3   -84.54
528223 [CHINA_DRAW 7345.00] AMP     5571.0   -84.81
528226 [HOPI_SUB   3115.00] AMP     6943.0   -79.87
528228 [WOOD_DRAW  3115.00] AMP     7059.7   -79.78
528230 [AGAVE_RHILL3115.00] AMP     9690.0   -82.53
528232 [OCHOA      3115.00] AMP     9508.4   -82.25
528235 [WOLFCAMP_TP3115.00] AMP    10469.0   -82.62
528236 [WOLFCAMP   3115.00] AMP     9771.2   -82.51
528239 [PNDEROSATP 3115.00] AMP     7030.6   -78.48
528333 [LE-WEST_SUB3115.00] AMP     8337.3   -81.32
528334 [LE-NRTH_INT3115.00] AMP     8260.6   -81.23
528348 [BUCKEYE_TP 3115.00] AMP     8150.4   -81.61
528353 [MADDOXG23  3115.00] AMP    25339.9   -84.57
528355 [MADDOX     3115.00] AMP    25339.9   -84.57
528392 [PEARLE     3115.00] AMP     6298.0   -73.70
528394 [QUAHADA    3115.00] AMP     8155.1   -76.62
528396 [XTO_LOAD#4  115.00] AMP     8893.3   -77.95
528399 [LEA_NATIONL3115.00] AMP     6862.9   -75.20
528422 [DCP_ZIA TP 3115.00] AMP     7059.8   -75.79
528433 [BENSING    3115.00] AMP     7939.8   -73.49
528435 [MILLEN     3115.00] AMP    11382.6   -73.96
528442 [NE_HOBBS   3115.00] AMP    11675.6   -74.73
528463 [SANGER_SW  3115.00] AMP    15484.5   -80.19
528491 [MONUMENT   3115.00] AMP    15094.3   -81.91
528568 [MONUMNT_TP 3115.00] AMP     9881.0   -76.58
528602 [ANDREWS    3115.00] AMP    12517.7   -84.08
528603 [NA_ENRICH  3115.00] AMP    11884.3   -82.77
528604 [ANDREWS    6345.00] AMP     6260.3   -85.48
528610 [GAINES_GEN 6230.00] AMP     8800.2   -86.01
528611 [GAINESGENTP6345.00] AMP     6830.2   -85.93
560022 [CRAWFISH_DR 345.00] AMP    22811.8   -86.36
560059 [G1579&G1580T230.00] AMP     9064.6   -83.37
562480 [G13-027-TAP 230.00] AMP     9463.0   -82.98
583960 [G14034G14035115.00] AMP     6741.0   -83.60
584940 [GEN-2015-056345.00] AMP     7918.2   -85.14
585160 [G1579&G1580 230.00] AMP     8608.6   -83.25
587110 [GEN-2016-015345.00] AMP     5993.5   -85.08
587420 [GEN-2016-062345.00] AMP     4946.1   -85.23
587470 [GEN-2016-069115.00] AMP     6916.8   -83.75
587670 [GEN-2015-099115.00] AMP    16451.5   -80.76
587990 [GEN-2016-121115.00] AMP     9530.3   -82.13
588000 [GEN-2016-123345.00] AMP     9693.4   -85.37
588350 [GEN-2016-171230.00] AMP     8838.6   -83.31
588430 [GEN-2016-169345.00] AMP     8294.3   -86.71
599960 [EPTNP-D6    230.00] AMP     9677.1   -84.82
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11.6.8 GEN-2018-075T 2026S

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                                PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:26
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2026S WITH MMWG 2026S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                    THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 90753 [G18075-SUB  115.00] AMP    27185.1   -85.63
 90781 [G18-078-TAP 345.00] AMP     7331.8   -85.52
511456 [O.K.U.-7    345.00] AMP     5565.8   -84.56
515458 [BORDER     7345.00] AMP    12591.4   -85.75
523961 [POTTER_CO  7345.00] AMP    11439.3   -86.00
524875 [OASIS      6230.00] AMP     7527.1   -81.82
524885 [SN_JUAN_TAP6230.00] AMP     4851.8   -83.12
524889 [SN_JUAN_WND6230.00] AMP     4639.1   -83.17
525524 [TOLK_EAST  6230.00] AMP    30968.1   -86.16
525531 [TOLK_WEST  6230.00] AMP    30968.1   -86.16
525543 [TOLK_TAP   6230.00] AMP    30968.1   -86.16
525549 [TOLK       7345.00] AMP    16351.4   -86.43
525828 [TUCO_INT   3115.00] AMP    21377.3   -83.63
525830 [TUCO_INT   6230.00] AMP    30751.1   -85.94
525832 [TUCO_INT   7345.00] AMP    23902.2   -86.35
525840 [ANTELOPE_1 6230.00] AMP    30402.4   -85.94
525850 [ELK_CT1     345.00] AMP    23446.4   -86.31
525957 [HALE_WNDCL16230.00] AMP    10031.1   -84.28
526161 [CARLISLE   6230.00] AMP    14542.1   -83.80
526337 [JONES      6230.00] AMP    22079.5   -85.96
526435 [SUNDOWN    6230.00] AMP    11279.7   -82.46
526460 [AMOCO_SS   6230.00] AMP     9874.3   -82.43
526784 [AMOCOWASSON6230.00] AMP    14047.5   -84.91
526792 [PRENTICE   3115.00] AMP     5906.6   -75.53
526928 [PLAINS_INT 3115.00] AMP     9825.3   -78.14
526934 [YOAKUM     3115.00] AMP    16833.9   -82.88
526935 [YOAKUM     6230.00] AMP    18065.1   -85.09
526936 [YOAKUM_345  345.00] AMP     9796.6   -86.25
527009 [BRU_SUB    6230.00] AMP    14190.4   -84.53
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527010 [OXYBRU     6230.00] AMP    14070.1   -84.51
527041 [ARCO_TP    3115.00] AMP    13052.8   -78.96
527146 [MUSTANG    3115.00] AMP    22430.4   -84.23
527149 [MUSTANG    6230.00] AMP    15823.1   -85.68
527151 [GS-MUSTANG 6230.00] AMP    15823.1   -85.68
527194 [LG-PLSHILL 3115.00] AMP     7537.1   -76.23
527276 [SEMINOLE   6230.00] AMP     7287.5   -82.60
527363 [HIGG       3115.00] AMP    10133.0   -74.48
527455 [RSWL_SLRCOL3115.00] AMP     7094.6   -83.76
527470 [CHVS_SLRCOL3115.00] AMP     6777.8   -83.65
527482 [CHAVES_CNTY3115.00] AMP     7168.1   -83.79
527483 [CHAVES_CNTY6230.00] AMP     4557.3   -82.70
527501 [URTON      3115.00] AMP     5926.0   -81.68
527509 [PRICE_TAP  3115.00] AMP     5461.9   -81.77
527546 [SAMSON     3115.00] AMP     5578.5   -81.00
527564 [ROSWLL_INT 3115.00] AMP     5843.9   -81.24
527597 [TWEEDY     3115.00] AMP     5376.6   -80.58
527654 [RSVLT_CC_W 7345.00] AMP     7641.5   -85.11
527655 [RSVLT_CC_E 7345.00] AMP     8663.6   -85.23
527656 [CROSSROADS 7345.00] AMP     9851.0   -85.39
527707 [ARTESIA    3115.00] AMP     7040.1   -79.52
527710 [EAGLE_CREEK269.000] AMP     2339.6   -86.40
527711 [EAGLE_CREEK3115.00] AMP     7681.4   -79.78
527715 [NAVAJO_2TP 3115.00] AMP     7306.8   -79.47
527736 [NAVAJO_5TP 3115.00] AMP     7262.9   -79.43
527786 [ATOKA      3115.00] AMP     7361.0   -79.38
527793 [EDDY_STH   3115.00] AMP    12181.5   -84.01
527798 [EDDY_NTH   3115.00] AMP    12181.5   -84.01
527799 [EDDY_NORTH 6230.00] AMP     9731.2   -84.82
527802 [EDDY_CNTY  7345.00] AMP     8003.7   -85.36
527809 [CV-8_MILE  3115.00] AMP     5519.3   -84.54
527821 [CV-DAYTON +3115.00] AMP     7262.5   -79.27
527822 [CV-TURKYTRK3115.00] AMP     3493.2   -81.04
527864 [CUNNINHAM  3115.00] AMP    26601.9   -83.65
527865 [CUNNIGHM_N 6230.00] AMP    14908.5   -86.14
527867 [CUNNIGHM_S 6230.00] AMP    14908.5   -86.14
527891 [HOBBS_INT  3115.00] AMP    30158.8   -85.45
527894 [HOBBS_INT  6230.00] AMP    17059.6   -86.85
527896 [HOBBS_INT  7345.00] AMP    10826.7   -86.61
527929 [PCA        269.000] AMP     6347.2   -83.11
527930 [PCA        3115.00] AMP    11621.3   -79.59
527935 [CV-SKELLY  3115.00] AMP     3251.4   -80.41
527938 [CV-MALJAMAR3115.00] AMP     2875.9   -80.45
527943 [CV-LUSK    269.000] AMP     2256.3   -64.82
527947 [CV-LUSK    3115.00] AMP     3494.7   -80.39
527948 [CV-LUSK_TP 3115.00] AMP     4238.2   -80.31
527953 [LIVSTNRIDGE3115.00] AMP     7893.7   -78.46
527955 [SAGE_BRUSH 3115.00] AMP     5314.1   -78.22
527961 [POTASH_JCT 269.000] AMP     9044.2   -86.36
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527962 [POTASH_JCT 3115.00] AMP    16081.9   -83.84
527963 [POTASH_JCT 6230.00] AMP     7314.2   -84.33
527965 [KIOWA      7345.00] AMP     9061.7   -85.63
527980 [DUVAL_#1   269.000] AMP     5874.3   -77.77
527989 [NMPOTASH   269.000] AMP     2564.5   -69.16
527996 [KERMAC     269.000] AMP     2984.9   -70.24
527999 [INTREPDW_TP3115.00] AMP    13453.3   -82.30
528000 [INTREPIDWST3115.00] AMP    11394.8   -80.87
528009 [WIPP       3115.00] AMP     7373.7   -77.91
528016 [SAND_DUNES 3115.00] AMP     7212.8   -77.69
528018 [RED_BLUFF  3115.00] AMP     9122.1   -79.41
528019 [NEWSUB1_7   345.00] AMP     5812.1   -84.59
528020 [BOPCO_PKRLK3115.00] AMP    11887.7   -84.36
528022 [MISSCHEM#2 269.000] AMP     6876.9   -83.25
528025 [RDRUNNER   3115.00] AMP    10371.6   -83.43
528027 [RDRUNNER   7345.00] AMP     5930.3   -84.67
528029 [IMC_#2     269.000] AMP     4320.3   -79.61
528035 [IMC_#1_TP  3115.00] AMP     9744.1   -80.05
528037 [IMC_#1     3115.00] AMP     8690.7   -79.33
528040 [BATTLE_AXE 3115.00] AMP     2982.2   -78.49
528043 [UNITEDSALT 269.000] AMP     4142.8   -79.36
528070 [CV-AZMESA  3115.00] AMP     7585.2   -79.16
528076 [CV-WALTCYN 3115.00] AMP     4588.9   -76.55
528093 [7-RIVERS   269.000] AMP     2406.9   -86.37
528094 [7-RIVERS   3115.00] AMP     8528.4   -81.57
528095 [7-RIVERS   6230.00] AMP     6458.1   -83.40
528109 [CV-LAKEWOOD3115.00] AMP     6590.2   -78.86
528132 [OCOTILLO   3115.00] AMP     6251.6   -72.99
528137 [N_CANAL    3115.00] AMP     8837.9   -78.39
528145 [NATPOT_TP  269.000] AMP     8994.5   -86.28
528151 [FIESTA     3115.00] AMP     9959.8   -78.39
528159 [CARLSBAD   269.000] AMP     4898.0   -85.55
528160 [CARLSBAD   3115.00] AMP    11501.1   -79.18
528178 [PECOS      3115.00] AMP    12145.2   -80.35
528179 [PECOS      6230.00] AMP     6650.2   -83.75
528182 [NORTH_LOVNG3115.00] AMP    10005.5   -84.75
528185 [N_LOVING   7345.00] AMP     6602.7   -85.03
528190 [S_LOVING_TP269.000] AMP     3005.6   -80.49
528192 [SOUTH_LOVNG3115.00] AMP     7398.0   -82.54
528197 [CB_WTRFLDTP269.000] AMP     2636.7   -75.84
528218 [NAVAJOMALGA269.000] AMP     1768.0   -68.13
528222 [CHINA_DRAW 3115.00] AMP     9243.3   -84.52
528223 [CHINA_DRAW 7345.00] AMP     5803.5   -84.75
528226 [HOPI_SUB   3115.00] AMP     7000.9   -79.81
528228 [WOOD_DRAW  3115.00] AMP     7179.1   -79.71
528230 [AGAVE_RHILL3115.00] AMP     9933.3   -82.82
528232 [OCHOA      3115.00] AMP     9743.6   -82.56
528235 [WOLFCAMP_TP3115.00] AMP    10734.9   -82.61
528236 [WOLFCAMP   3115.00] AMP    10002.4   -82.50
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528239 [PNDEROSATP 3115.00] AMP     7195.4   -79.41
528246 [YESO_HILLS 3115.00] AMP     2905.6   -78.89
528333 [LE-WEST_SUB3115.00] AMP     8331.9   -81.31
528334 [LE-NRTH_INT3115.00] AMP     8255.8   -81.22
528348 [BUCKEYE_TP 3115.00] AMP     8138.3   -81.60
528353 [MADDOXG23  3115.00] AMP    25452.1   -84.56
528355 [MADDOX     3115.00] AMP    25452.1   -84.56
528392 [PEARLE     3115.00] AMP     6304.4   -73.68
528394 [QUAHADA    3115.00] AMP     8176.2   -76.58
528396 [XTO_LOAD#4  115.00] AMP     8937.7   -77.90
528399 [LEA_NATIONL3115.00] AMP     6875.9   -75.17
528422 [DCP_ZIA TP 3115.00] AMP     7075.6   -75.76
528433 [BENSING    3115.00] AMP     7933.2   -73.49
528435 [MILLEN     3115.00] AMP    11377.5   -73.94
528442 [NE_HOBBS   3115.00] AMP    11674.2   -74.71
528463 [SANGER_SW  3115.00] AMP    15513.2   -80.17
528491 [MONUMENT   3115.00] AMP    15152.2   -81.89
528568 [MONUMNT_TP 3115.00] AMP    10060.2   -78.65
528602 [ANDREWS    3115.00] AMP    13225.3   -84.36
528603 [NA_ENRICH  3115.00] AMP    12451.6   -83.11
528604 [ANDREWS    6345.00] AMP     7024.7   -85.23
528610 [GAINES_GEN 6230.00] AMP     9773.6   -85.75
528611 [GAINESGENTP6345.00] AMP     7817.5   -85.63
560021 [CRAWFISH_DR2230.00] AMP    25412.2   -85.41
560022 [CRAWFISH_DR 345.00] AMP    24464.6   -86.38
560059 [G1579&G1580T230.00] AMP     9099.2   -83.43
562480 [G13-027-TAP 230.00] AMP     9488.6   -82.99
583840 [GEN-2013-027230.00] AMP     8989.2   -83.11
583960 [G14034G14035115.00] AMP     6743.2   -83.60
584940 [GEN-2015-056345.00] AMP     7905.0   -85.14
585060 [GEN-2015-068345.00] AMP    16224.0   -85.79
585160 [G1579&G1580 230.00] AMP     8639.8   -83.30
587110 [GEN-2016-015345.00] AMP     6690.3   -84.79
587420 [GEN-2016-062345.00] AMP     5390.2   -85.00
587470 [GEN-2016-069115.00] AMP     6919.1   -83.75
587670 [GEN-2015-099115.00] AMP    16498.6   -80.74
587964 [G16-120-TAP 345.00] AMP     8591.6   -85.25
587990 [GEN-2016-121115.00] AMP     9764.2   -82.36
588000 [GEN-2016-123345.00] AMP     9673.6   -85.37
588350 [GEN-2016-171230.00] AMP     8871.5   -83.37
588430 [GEN-2016-169345.00] AMP    10491.0   -86.39
599960 [EPTNP-D6    230.00] AMP     9731.2   -84.82
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11.6.9 GEN-2018-078 2018S

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                                PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:31
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
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MDWG 2018S WITH MMWG 2017S

OPTIONS USED:
- SET PRE-FAULT VOLTAGE ON ALL BUSES TO 1.00 PU AT 0 PHASE SHIFT ANGLE
- SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
- SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
- SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
- SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
- SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING ADMITTANCE=0.0 IN +/-/0 SEQUENCES
- SET LOAD=0.0 IN +/- SEQUENCES
- DC LINES AND FACTS DEVICES BLOCKED
- IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

X---------- BUS ----------X		THREE PHASE FAULT /I+/	AN(I+)
90753 [G18075-SUB 115.00]	AMP	25442.4	-85.78
90781 [G18-078-TAP 345.00]	AMP	7297.9	-85.54
511456 [O.K.U.-7 345.00]	AMP	5542.0	-84.57
511468 [L.E.S.-7 345.00]	AMP	13195.5	-84.79
511553 [CHISHOLM7 345.00]	AMP	12927.3	-85.48
511565 [OKLAUN HVDC7345.00]	AMP	5525.3	-84.57
515375 [WWRDEHV7 345.00]	AMP	19960.7	-86.08
515458 [BORDER 7345.00]	AMP	12557.1	-85.75
523095 [HITCHLAND 6230.00]	AMP	15147.7	-86.29
523097 [HITCHLAND 7345.00]	AMP	16056.2	-85.89
523101 [NOBLE_WND 7345.00]	AMP	15985.9	-85.89
523112 [NOVUS1 7345.00]	AMP	15748.2	-85.86
523215 [FREWHELCOL17345.00]	AMP	9476.2	-85.60
523309 [MOORE_CNTY 6230.00]	AMP	6987.1	-82.69
523823 [WALKEMEYER 7345.00]	AMP	8301.7	-84.90
523869 [CHAN+TASCOS6230.00]	AMP	4370.5	-81.51
523959 [POTTER_CO 6230.00]	AMP	22657.3	-85.03
523961 [POTTER_CO 7345.00]	AMP	11551.4	-86.04
523979 [HARRNG_EST 6230.00]	AMP	27434.9	-86.37
524010 [ROLLHILLS 6230.00]	AMP	20514.3	-84.86
524267 [BUSHLAND 6230.00]	AMP	9882.5	-82.96
524296 [SPNSPUR_WND7345.00]	AMP	5562.6	-85.08
524875 [OASIS 6230.00]	AMP	7522.9	-81.81
524885 [SN_JUAN_TAP6230.00]	AMP	4854.3	-83.11
524889 [SN_JUAN_WND6230.00]	AMP	4641.4	-83.16
524909 [ROSEVELT_N 6230.00]	AMP	9101.1	-81.93
524911 [ROSEVELT_S 6230.00]	AMP	9101.1	-81.93
525213 [SWISHER 6230.00]	AMP	11161.1	-82.39
525461 [NEWHART 6230.00]	AMP	11530.4	-82.16
525481 [PLANT_X 6230.00]	AMP	24074.6	-84.80
525524 [TOLK_EAST 6230.00]	AMP	31507.4	-86.23
525531 [TOLK_WEST 6230.00]	AMP	31507.4	-86.23
525543 [TOLK_TAP 6230.00]	AMP	31507.4	-86.23

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525549 [TOLK       7345.00] AMP    16455.4   -86.46
525637 [LAMB_CNTY  6230.00] AMP     5444.3   -81.75
525830 [TUCO_INT   6230.00] AMP    29794.0   -85.79
525832 [TUCO_INT   7345.00] AMP    22170.6   -86.32
525850 [ELK_CT1     345.00] AMP    21778.5   -86.28
527455 [RSWL_SLRCOL3115.00] AMP     7092.2   -83.76
527470 [CHVS_SLRCOL3115.00] AMP     6775.6   -83.65
527482 [CHAVES_CNTY3115.00] AMP     7165.6   -83.79
527483 [CHAVES_CNTY6230.00] AMP     4556.0   -82.70
527501 [URTON      3115.00] AMP     5919.4   -81.68
527509 [PRICE_TAP  3115.00] AMP     5460.5   -81.77
527546 [SAMSON     3115.00] AMP     5574.6   -81.00
527564 [ROSWLL_INT 3115.00] AMP     5836.0   -81.23
527597 [TWEEDY     3115.00] AMP     5370.1   -80.57
527654 [RSVLT_CC_W 7345.00] AMP     7652.9   -85.11
527655 [RSVLT_CC_E 7345.00] AMP     8679.0   -85.23
527656 [CROSSROADS 7345.00] AMP     9871.7   -85.39
527707 [ARTESIA    3115.00] AMP     7024.6   -79.54
527710 [EAGLE_CREEK269.000] AMP     2338.6   -86.40
527711 [EAGLE_CREEK3115.00] AMP     7662.9   -79.80
527715 [NAVAJO_2TP 3115.00] AMP     7290.2   -79.49
527736 [NAVAJO_5TP 3115.00] AMP     7246.5   -79.46
527786 [ATOKA      3115.00] AMP     7343.9   -79.41
527793 [EDDY_STH   3115.00] AMP    12135.6   -84.03
527798 [EDDY_NTH   3115.00] AMP    12135.6   -84.03
527799 [EDDY_NORTH 6230.00] AMP     9677.1   -84.82
527802 [EDDY_CNTY  7345.00] AMP     7811.4   -85.45
527809 [CV-8_MILE  3115.00] AMP     5509.9   -84.55
527821 [CV-DAYTON +3115.00] AMP     7246.0   -79.29
527822 [CV-TURKYTRK3115.00] AMP     3489.5   -81.04
527864 [CUNNINHAM  3115.00] AMP    26723.7   -83.71
527865 [CUNNIGHM_N 6230.00] AMP    16570.8   -86.61
527867 [CUNNIGHM_S 6230.00] AMP    16570.8   -86.61
527891 [HOBBS_INT  3115.00] AMP    30312.0   -85.53
527894 [HOBBS_INT  6230.00] AMP    17761.9   -86.89
527896 [HOBBS_INT  7345.00] AMP     8502.6   -86.89
527929 [PCA        269.000] AMP     6323.2   -83.11
527930 [PCA        3115.00] AMP    11514.1   -79.64
527948 [CV-LUSK_TP 3115.00] AMP     4223.8   -80.33
527961 [POTASH_JCT 269.000] AMP     8992.9   -86.35
527962 [POTASH_JCT 3115.00] AMP    15800.9   -83.83
527963 [POTASH_JCT 6230.00] AMP     7350.0   -84.31
527965 [KIOWA      7345.00] AMP     8480.8   -85.78
527980 [DUVAL_#1   269.000] AMP     5852.6   -77.79
527996 [KERMAC     269.000] AMP     2979.4   -70.27
527999 [INTREPDW_TP3115.00] AMP    13176.0   -81.75
528000 [INTREPIDWST3115.00] AMP    11193.1   -80.43
528018 [RED_BLUFF  3115.00] AMP     8931.8   -79.36
528019 [NEWSUB1_7   345.00] AMP     5578.4   -84.62
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528020 [BOPCO_PKRLK3115.00] AMP    11561.0   -84.34
528022 [MISSCHEM#2 269.000] AMP     6847.1   -83.25
528025 [RDRUNNER   3115.00] AMP    10108.8   -83.16
528027 [RDRUNNER   7345.00] AMP     5686.3   -84.69
528035 [IMC_#1_TP  3115.00] AMP     9499.4   -78.96
528040 [BATTLE_AXE 3115.00] AMP     2959.9   -78.44
528070 [CV-AZMESA  3115.00] AMP     7562.4   -79.19
528093 [7-RIVERS   269.000] AMP     2405.8   -86.37
528094 [7-RIVERS   3115.00] AMP     8504.4   -81.60
528095 [7-RIVERS   6230.00] AMP     6443.4   -83.41
528109 [CV-LAKEWOOD3115.00] AMP     6576.3   -78.89
528132 [OCOTILLO   3115.00] AMP     6229.7   -73.05
528137 [N_CANAL    3115.00] AMP     8793.1   -78.45
528145 [NATPOT_TP  269.000] AMP     8943.8   -86.26
528151 [FIESTA     3115.00] AMP     9898.6   -78.46
528159 [CARLSBAD   269.000] AMP     4890.2   -85.56
528160 [CARLSBAD   3115.00] AMP    11419.4   -79.25
528178 [PECOS      3115.00] AMP    12060.2   -80.42
528179 [PECOS      6230.00] AMP     6650.2   -83.73
528182 [NORTH_LOVNG3115.00] AMP     9803.7   -84.77
528185 [N_LOVING   7345.00] AMP     6301.7   -85.13
528222 [CHINA_DRAW 3115.00] AMP     9048.3   -84.54
528223 [CHINA_DRAW 7345.00] AMP     5571.0   -84.81
528226 [HOPI_SUB   3115.00] AMP     6943.0   -79.87
528230 [AGAVE_RHILL3115.00] AMP     9690.0   -82.53
528396 [XTO_LOAD#4  115.00] AMP     8893.3   -77.95
528604 [ANDREWS    6345.00] AMP     6260.3   -85.48
528610 [GAINES_GEN 6230.00] AMP     8800.2   -86.01
528611 [GAINESGENTP6345.00] AMP     6830.2   -85.93
560010 [G14-037-TAP 345.00] AMP    15706.3   -85.99
560021 [CRAWFISH_DR2230.00] AMP    24731.4   -85.30
560022 [CRAWFISH_DR 345.00] AMP    22811.8   -86.36
560035 [GRAPEVINE   345.00] AMP     6510.9   -85.17
560059 [G1579&G1580T230.00] AMP     9064.6   -83.37
562480 [G13-027-TAP 230.00] AMP     9463.0   -82.98
576395 [GEN-2010-014345.00] AMP    11645.2   -83.00
583090 [G1149&G1504 345.00] AMP     9860.1   -85.40
583960 [G14034G14035115.00] AMP     6741.0   -83.60
584940 [GEN-2015-056345.00] AMP     7918.2   -85.14
585060 [GEN-2015-068345.00] AMP    15424.2   -85.80
587470 [GEN-2016-069115.00] AMP     6916.8   -83.75
587960 [GEN-2016-120345.00] AMP     6363.1   -85.07
587964 [G16-120-TAP 345.00] AMP     8505.1   -85.27
587970 [GEN-2016-175345.00] AMP     5111.7   -84.91
587990 [GEN-2016-121115.00] AMP     9530.3   -82.13
588000 [GEN-2016-123345.00] AMP     9693.4   -85.37
588430 [GEN-2016-169345.00] AMP     8294.3   -86.71
599960 [EPTNP-D6    230.00] AMP     9677.1   -84.82
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11.6.10 GEN-2018-078 2026S

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                                PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  18:31
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2026S WITH MMWG 2026S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                    THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 90753 [G18075-SUB  115.00] AMP    27185.1   -85.63
 90781 [G18-078-TAP 345.00] AMP     7331.8   -85.52
511456 [O.K.U.-7    345.00] AMP     5565.8   -84.56
511468 [L.E.S.-7    345.00] AMP    13318.9   -84.79
511553 [CHISHOLM7   345.00] AMP    12949.5   -85.48
511565 [OKLAUN HVDC7345.00] AMP     5549.0   -84.56
515375 [WWRDEHV7    345.00] AMP    19998.8   -86.07
515458 [BORDER     7345.00] AMP    12591.4   -85.75
523095 [HITCHLAND  6230.00] AMP    15121.9   -86.31
523097 [HITCHLAND  7345.00] AMP    16043.1   -85.89
523101 [NOBLE_WND  7345.00] AMP    15972.9   -85.89
523112 [NOVUS1     7345.00] AMP    15735.6   -85.86
523215 [FREWHELCOL17345.00] AMP     9471.9   -85.60
523309 [MOORE_CNTY 6230.00] AMP     6937.0   -82.72
523823 [WALKEMEYER 7345.00] AMP     8326.5   -84.90
523869 [CHAN+TASCOS6230.00] AMP     4342.4   -81.54
523959 [POTTER_CO  6230.00] AMP    21824.3   -85.00
523961 [POTTER_CO  7345.00] AMP    11439.3   -86.00
523979 [HARRNG_EST 6230.00] AMP    25753.5   -86.13
524010 [ROLLHILLS  6230.00] AMP    19589.7   -84.76
524267 [BUSHLAND   6230.00] AMP     9732.0   -82.98
524296 [SPNSPUR_WND7345.00] AMP     5538.1   -85.07
524875 [OASIS      6230.00] AMP     7527.1   -81.82
524885 [SN_JUAN_TAP6230.00] AMP     4851.8   -83.12
524889 [SN_JUAN_WND6230.00] AMP     4639.1   -83.17
524909 [ROSEVELT_N 6230.00] AMP     9093.2   -81.94
524911 [ROSEVELT_S 6230.00] AMP     9093.2   -81.94
525213 [SWISHER    6230.00] AMP    11071.6   -82.42
525461 [NEWHART    6230.00] AMP    11379.8   -82.18
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525481 [PLANT_X    6230.00] AMP    23413.8   -84.56
525524 [TOLK_EAST  6230.00] AMP    30968.1   -86.16
525531 [TOLK_WEST  6230.00] AMP    30968.1   -86.16
525543 [TOLK_TAP   6230.00] AMP    30968.1   -86.16
525549 [TOLK       7345.00] AMP    16351.4   -86.43
525637 [LAMB_CNTY  6230.00] AMP     5548.8   -82.09
525830 [TUCO_INT   6230.00] AMP    30751.1   -85.94
525832 [TUCO_INT   7345.00] AMP    23902.2   -86.35
525850 [ELK_CT1     345.00] AMP    23446.4   -86.31
526935 [YOAKUM     6230.00] AMP    18065.1   -85.09
526936 [YOAKUM_345  345.00] AMP     9796.6   -86.25
527455 [RSWL_SLRCOL3115.00] AMP     7094.6   -83.76
527470 [CHVS_SLRCOL3115.00] AMP     6777.8   -83.65
527482 [CHAVES_CNTY3115.00] AMP     7168.1   -83.79
527483 [CHAVES_CNTY6230.00] AMP     4557.3   -82.70
527501 [URTON      3115.00] AMP     5926.0   -81.68
527509 [PRICE_TAP  3115.00] AMP     5461.9   -81.77
527546 [SAMSON     3115.00] AMP     5578.5   -81.00
527564 [ROSWLL_INT 3115.00] AMP     5843.9   -81.24
527597 [TWEEDY     3115.00] AMP     5376.6   -80.58
527654 [RSVLT_CC_W 7345.00] AMP     7641.5   -85.11
527655 [RSVLT_CC_E 7345.00] AMP     8663.6   -85.23
527656 [CROSSROADS 7345.00] AMP     9851.0   -85.39
527707 [ARTESIA    3115.00] AMP     7040.1   -79.52
527710 [EAGLE_CREEK269.000] AMP     2339.6   -86.40
527711 [EAGLE_CREEK3115.00] AMP     7681.4   -79.78
527715 [NAVAJO_2TP 3115.00] AMP     7306.8   -79.47
527736 [NAVAJO_5TP 3115.00] AMP     7262.9   -79.43
527786 [ATOKA      3115.00] AMP     7361.0   -79.38
527793 [EDDY_STH   3115.00] AMP    12181.5   -84.01
527798 [EDDY_NTH   3115.00] AMP    12181.5   -84.01
527799 [EDDY_NORTH 6230.00] AMP     9731.2   -84.82
527802 [EDDY_CNTY  7345.00] AMP     8003.7   -85.36
527809 [CV-8_MILE  3115.00] AMP     5519.3   -84.54
527821 [CV-DAYTON +3115.00] AMP     7262.5   -79.27
527822 [CV-TURKYTRK3115.00] AMP     3493.2   -81.04
527864 [CUNNINHAM  3115.00] AMP    26601.9   -83.65
527865 [CUNNIGHM_N 6230.00] AMP    14908.5   -86.14
527867 [CUNNIGHM_S 6230.00] AMP    14908.5   -86.14
527891 [HOBBS_INT  3115.00] AMP    30158.8   -85.45
527894 [HOBBS_INT  6230.00] AMP    17059.6   -86.85
527896 [HOBBS_INT  7345.00] AMP    10826.7   -86.61
527929 [PCA        269.000] AMP     6347.2   -83.11
527930 [PCA        3115.00] AMP    11621.3   -79.59
527948 [CV-LUSK_TP 3115.00] AMP     4238.2   -80.31
527961 [POTASH_JCT 269.000] AMP     9044.2   -86.36
527962 [POTASH_JCT 3115.00] AMP    16081.9   -83.84
527963 [POTASH_JCT 6230.00] AMP     7314.2   -84.33
527965 [KIOWA      7345.00] AMP     9061.7   -85.63
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527980 [DUVAL_#1   269.000] AMP     5874.3   -77.77
527996 [KERMAC     269.000] AMP     2984.9   -70.24
527999 [INTREPDW_TP3115.00] AMP    13453.3   -82.30
528000 [INTREPIDWST3115.00] AMP    11394.8   -80.87
528018 [RED_BLUFF  3115.00] AMP     9122.1   -79.41
528019 [NEWSUB1_7   345.00] AMP     5812.1   -84.59
528020 [BOPCO_PKRLK3115.00] AMP    11887.7   -84.36
528022 [MISSCHEM#2 269.000] AMP     6876.9   -83.25
528025 [RDRUNNER   3115.00] AMP    10371.6   -83.43
528027 [RDRUNNER   7345.00] AMP     5930.3   -84.67
528035 [IMC_#1_TP  3115.00] AMP     9744.1   -80.05
528040 [BATTLE_AXE 3115.00] AMP     2982.2   -78.49
528070 [CV-AZMESA  3115.00] AMP     7585.2   -79.16
528093 [7-RIVERS   269.000] AMP     2406.9   -86.37
528094 [7-RIVERS   3115.00] AMP     8528.4   -81.57
528095 [7-RIVERS   6230.00] AMP     6458.1   -83.40
528109 [CV-LAKEWOOD3115.00] AMP     6590.2   -78.86
528132 [OCOTILLO   3115.00] AMP     6251.6   -72.99
528137 [N_CANAL    3115.00] AMP     8837.9   -78.39
528145 [NATPOT_TP  269.000] AMP     8994.5   -86.28
528151 [FIESTA     3115.00] AMP     9959.8   -78.39
528159 [CARLSBAD   269.000] AMP     4898.0   -85.55
528160 [CARLSBAD   3115.00] AMP    11501.1   -79.18
528178 [PECOS      3115.00] AMP    12145.2   -80.35
528179 [PECOS      6230.00] AMP     6650.2   -83.75
528182 [NORTH_LOVNG3115.00] AMP    10005.5   -84.75
528185 [N_LOVING   7345.00] AMP     6602.7   -85.03
528192 [SOUTH_LOVNG3115.00] AMP     7398.0   -82.54
528222 [CHINA_DRAW 3115.00] AMP     9243.3   -84.52
528223 [CHINA_DRAW 7345.00] AMP     5803.5   -84.75
528226 [HOPI_SUB   3115.00] AMP     7000.9   -79.81
528230 [AGAVE_RHILL3115.00] AMP     9933.3   -82.82
528396 [XTO_LOAD#4  115.00] AMP     8937.7   -77.90
528604 [ANDREWS    6345.00] AMP     7024.7   -85.23
528610 [GAINES_GEN 6230.00] AMP     9773.6   -85.75
528611 [GAINESGENTP6345.00] AMP     7817.5   -85.63
560010 [G14-037-TAP 345.00] AMP    15695.2   -86.00
560021 [CRAWFISH_DR2230.00] AMP    25412.2   -85.41
560022 [CRAWFISH_DR 345.00] AMP    24464.6   -86.38
560035 [GRAPEVINE   345.00] AMP     6497.0   -85.17
560059 [G1579&G1580T230.00] AMP     9099.2   -83.43
562480 [G13-027-TAP 230.00] AMP     9488.6   -82.99
576395 [GEN-2010-014345.00] AMP    11638.6   -83.00
583090 [G1149&G1504 345.00] AMP     9880.7   -85.40
583960 [G14034G14035115.00] AMP     6743.2   -83.60
584940 [GEN-2015-056345.00] AMP     7905.0   -85.14
585060 [GEN-2015-068345.00] AMP    16224.0   -85.79
587470 [GEN-2016-069115.00] AMP     6919.1   -83.75
587960 [GEN-2016-120345.00] AMP     6402.6   -85.06
```

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587964 [G16-120-TAP 345.00] AMP     8591.6   -85.25
587970 [GEN-2016-175345.00] AMP     5139.0   -84.90
587990 [GEN-2016-121115.00] AMP     9764.2   -82.36
588000 [GEN-2016-123345.00] AMP     9673.6   -85.37
588430 [GEN-2016-169345.00] AMP    10491.0   -86.39
599960 [EPTNP-D6    230.00] AMP     9731.2   -84.82
```

11.6.11 GEN-2018-127 2018S

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                              PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  17:31
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2018S WITH MMWG 2017S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                  THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 91271 [G18127-SUB  138.00] AMP    10260.9   -81.77
300136 [4MEMORAL    138.00] AMP    20667.7   -81.86
514510 [BURGETT4    138.00] AMP    22578.4   -84.81
514714 [WOODRNG4    138.00] AMP    19869.2   -83.48
514733 [MARSHL 4    138.00] AMP     8437.9   -80.79
514774 [HENESEY4    138.00] AMP     8926.0   -80.48
514827 [CTNWOOD4    138.00] AMP    19054.6   -81.15
514829 [PINE ST4    138.00] AMP    12628.3   -78.24
514830 [FITZGRD4    138.00] AMP     9229.6   -77.13
514831 [WATRLOO4    138.00] AMP    14701.1   -81.53
514842 [CHTWOOD4    138.00] AMP    21090.1   -83.09
514880 [NORTWST7    345.00] AMP    32516.8   -86.09
514906 [JNSKAMO4    138.00] AMP    20811.3   -81.88
514907 [ARCADIA4    138.00] AMP    42568.8   -85.69
514908 [ARCADIA7    345.00] AMP    26502.2   -86.52
514909 [REDBUD 7    345.00] AMP    25493.1   -86.86
514941 [HSL    4    138.00] AMP    44552.9   -84.05
515008 [KINZE  4    138.00] AMP    13817.5   -80.27
515045 [SEMINOL7    345.00] AMP    26581.6   -86.12
515373 [LBRTYLK4    138.00] AMP    14401.7   -81.25
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515377 [CRESENT4    138.00] AMP    10260.9   -81.77
515461 [RNDBARN4    138.00] AMP    40408.7   -85.61
515465 [LGARBER4    138.00] AMP    21405.3   -82.35
515467 [WHITESB4    138.00] AMP    15763.0   -81.87
520600 [EKNGFSH3    138.00] AMP     5283.2   -78.67
520603 [NKNGFSH     138.00] AMP     6187.2   -78.94
520847 [CASHION4    138.00] AMP     5985.9   -79.30
520879 [DOVER  4    138.00] AMP     7047.1   -79.29
520881 [DOVERSW2    69.000] AMP     6654.2   -83.36
520882 [DOVERSW4    138.00] AMP     9976.6   -80.35
521006 [MARSHAL4    138.00] AMP     8395.3   -80.73
521016 [OKEENE 4    138.00] AMP     5005.8   -75.09
521037 [REEDING2    138.00] AMP     4893.5   -78.80
521073 [TWNLAKE4    138.00] AMP     8303.3   -80.62
560077 [G16-032-TAP 345.00] AMP     4236.1   -80.96
587210 [GEN-2016-032138.00] AMP     8917.5   -81.57
587940 [GEN-2016-118138.00] AMP     7518.3   -83.39
```

11.6.12 GEN-2018-127 2016S

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                                PSS(R)E-33.10.0 ASCC SHORT CIRCUIT CURRENTS
FRI, FEB 22 2019  17:32
2016 MDWG FINAL WITH 2015 SERIES MMWG FINAL
MDWG 2026S WITH MMWG 2026S

OPTIONS USED:
    - SET PRE-FAULT VOLTAGE ON ALL BUSES TO  1.00 PU AT 0 PHASE SHIFT ANGLE
    - SET SYNCHRONOUS/ASYNCHRONOUS MACHINE POWER OUTPUTS TO P=0.0, Q=0.0
    - SET GENERATOR POSITIVE SEQUENCE REACTANCES TO SUBTRANSIENT
    - SET TRANSFORMER TAP RATIOS=1.0 PU AND PHASE SHIFT ANGLES=0.0
    - SET LINE CHARGING=0.0 IN +/-/0 SEQUENCES
    - SET LINE/FIXED/SWITCHED SHUNTS=0.0 AND TRANSFORMER MAGNETIZING
ADMITTANCE=0.0 IN +/-/0 SEQUENCES
    - SET LOAD=0.0 IN +/- SEQUENCES
    - DC LINES AND FACTS DEVICES BLOCKED
    - IMPEDANCE CORRECTIONS APPLIED TO TRANSFORMER ZERO SEQUENCE IMPEDANCES

                                  THREE PHASE FAULT
X---------- BUS ----------X          /I+/    AN(I+)
 91271 [G18127-SUB  138.00] AMP    10269.7   -81.78
300136 [4MEMORAL    138.00] AMP    20391.2   -81.88
514510 [BURGETT4    138.00] AMP    22459.0   -84.83
514714 [WOODRNG4    138.00] AMP    19915.4   -83.46
514733 [MARSHL 4    138.00] AMP     8441.3   -80.78
514774 [HENESEY4    138.00] AMP     8969.7   -80.51
514827 [CTNWOOD4    138.00] AMP    19029.8   -81.16
514829 [PINE ST4    138.00] AMP    12618.9   -78.24
514830 [FITZGRD4    138.00] AMP     9226.7   -77.13
514831 [WATRLOO4    138.00] AMP    14666.5   -81.54
```

```
514842 [CHTWOOD4    138.00] AMP    20790.3   -83.05
514880 [NORTWST7    345.00] AMP    32413.9   -86.09
514906 [JNSKAMO4    138.00] AMP    20530.3   -81.89
514907 [ARCADIA4    138.00] AMP    42277.7   -85.73
514908 [ARCADIA7    345.00] AMP    26609.9   -86.55
514909 [REDBUD 7    345.00] AMP    25832.4   -86.82
514941 [HSL    4    138.00] AMP    41002.5   -83.61
515008 [KINZE  4    138.00] AMP    13826.5   -80.23
515045 [SEMINOL7    345.00] AMP    26549.0   -86.12
515373 [LBRTYLK4    138.00] AMP    14375.2   -81.26
515377 [CRESENT4    138.00] AMP    10269.7   -81.78
515461 [RNDBARN4    138.00] AMP    40142.2   -85.64
515465 [LGARBER4    138.00] AMP    21239.2   -82.36
515467 [WHITESB4    138.00] AMP    15717.8   -81.88
520600 [EKNGFSH3    138.00] AMP     5299.0   -78.69
520603 [NKNGFSH     138.00] AMP     6211.9   -78.97
520847 [CASHION4    138.00] AMP     5996.5   -79.31
520879 [DOVER  4    138.00] AMP     7071.1   -79.31
520881 [DOVERSW2    69.000] AMP     6818.4   -83.40
520882 [DOVERSW4    138.00] AMP    10052.9   -80.41
521006 [MARSHAL4    138.00] AMP     8398.7   -80.73
521016 [OKEENE 4    138.00] AMP     5038.3   -75.16
521037 [REEDING2    138.00] AMP     4903.5   -78.81
521073 [TWNLAKE4    138.00] AMP     8319.1   -80.62
560077 [G16-032-TAP 345.00] AMP     4235.4   -80.96
587210 [GEN-2016-032138.00] AMP     8916.4   -81.57
587940 [GEN-2016-118138.00] AMP     7549.0   -83.43
```

11.7 APPENDIX G

Proposed Point of Interconnection Slider Diagrams

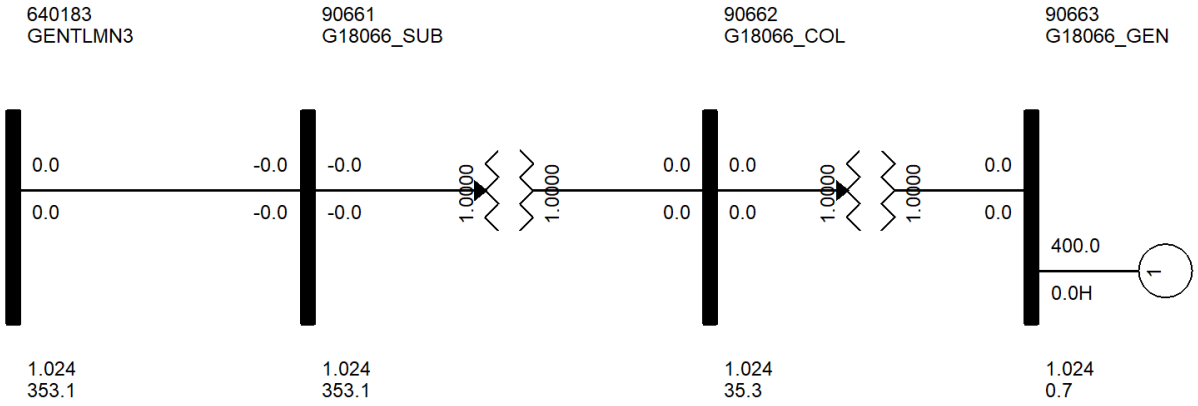

Figure 11-1: GEN-2018-066 Primary Point of Interconnection

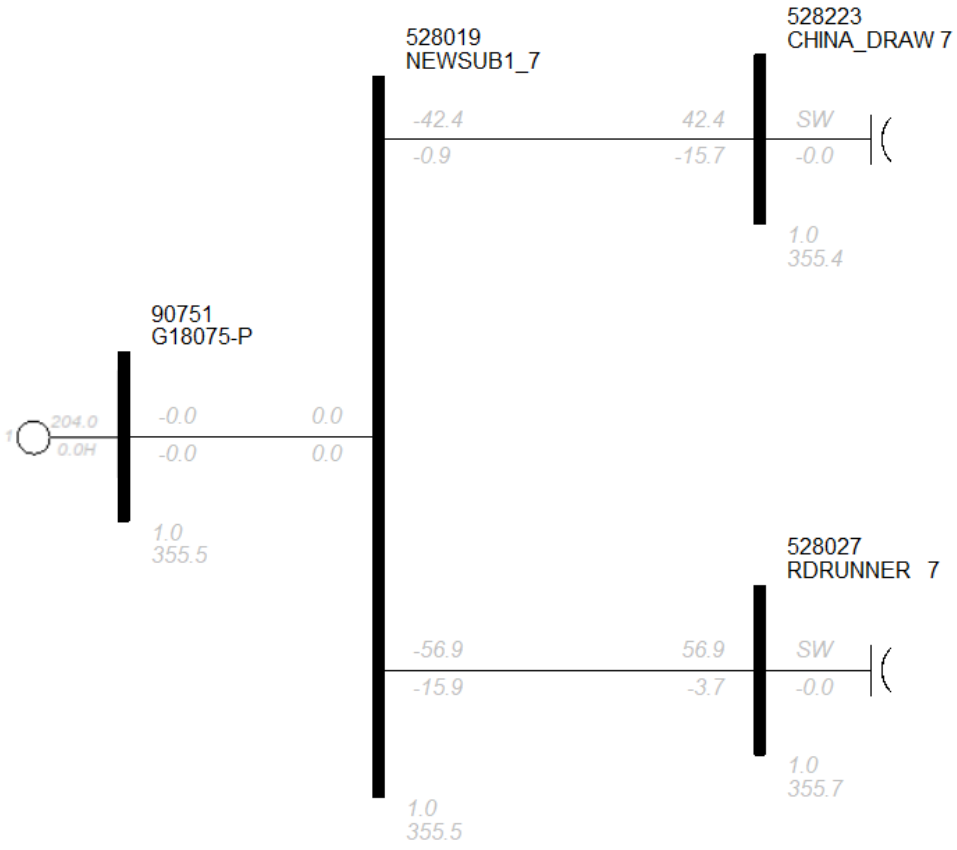

Figure 11-2: GEN-2018-075 (SP) Primary Point of Interconnection

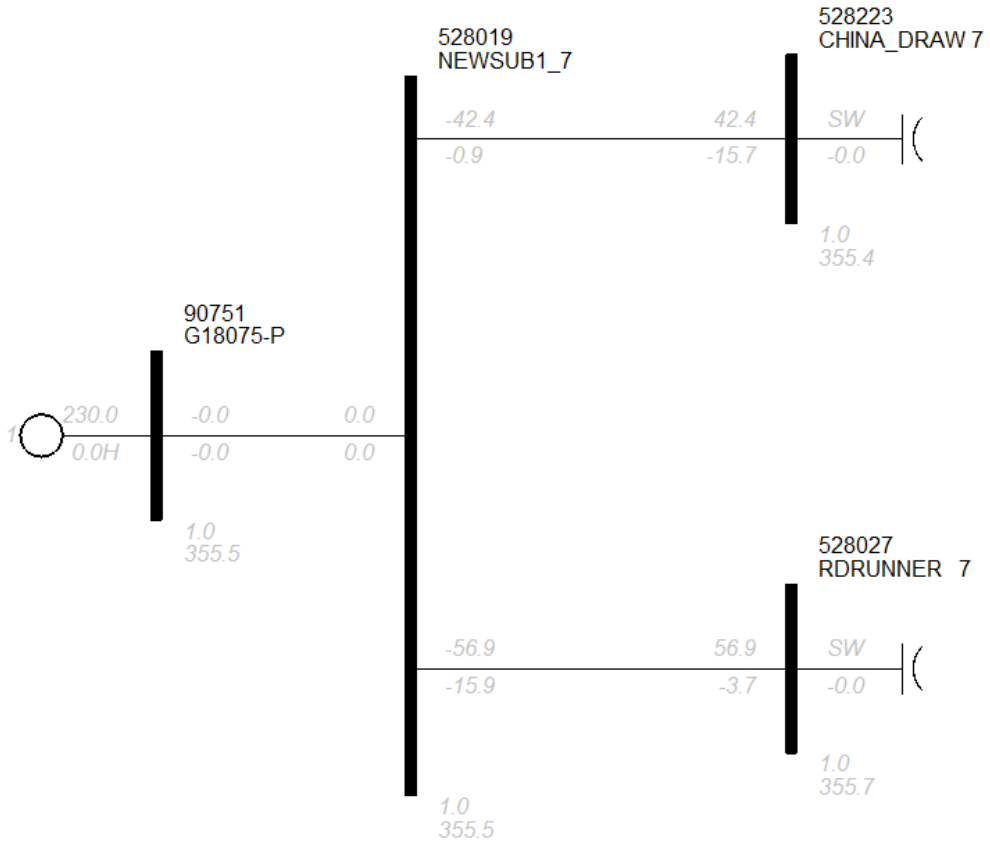

Figure 11-3: GEN-2018-075 (WP) Primary Point of Interconnection

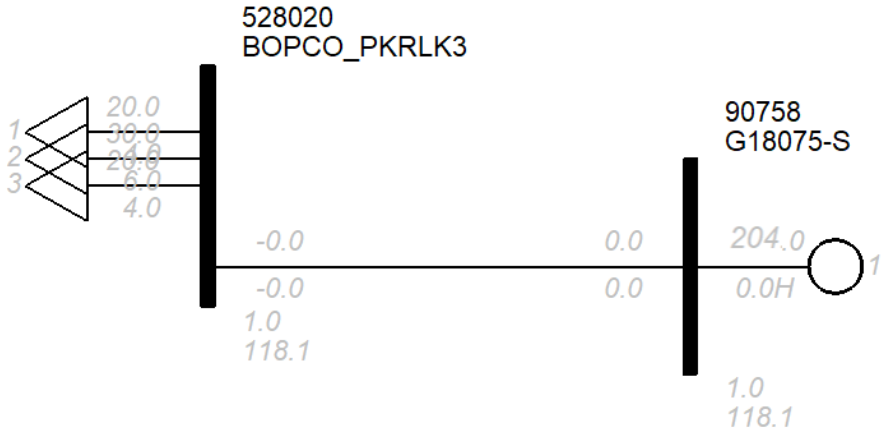

Figure 11-4: GEN-2018-075 (SP) Secondary Point of Interconnection

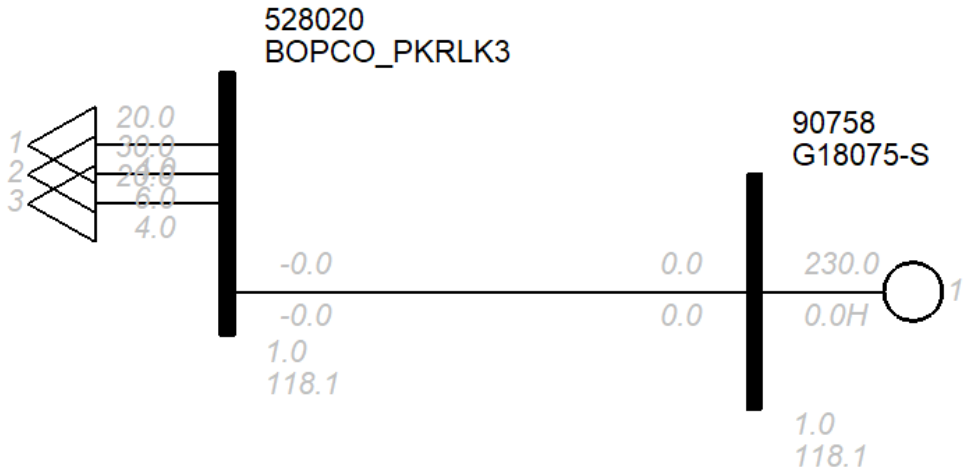

Figure 11-5: GEN-2018-075 (WP) Secondary Point of Interconnection

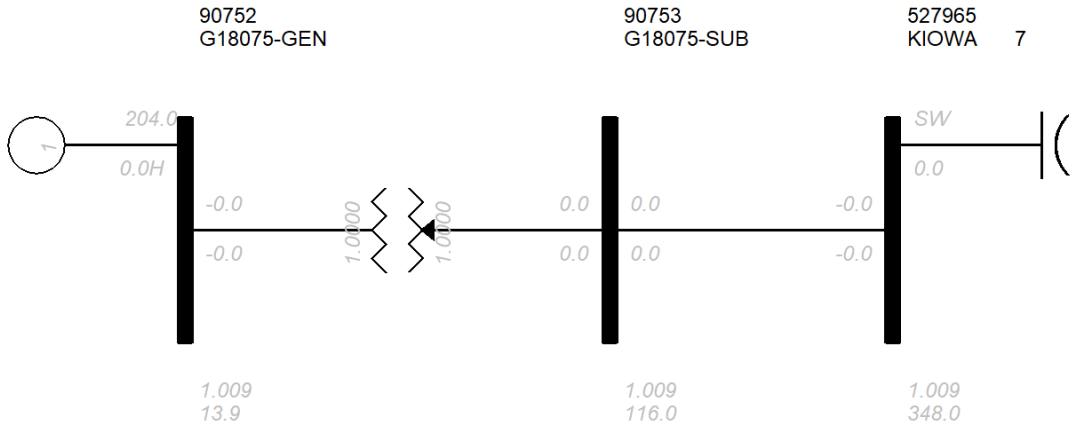

Figure 11-6: GEN-2018-075 (SP) Tertiary Point of Interconnection

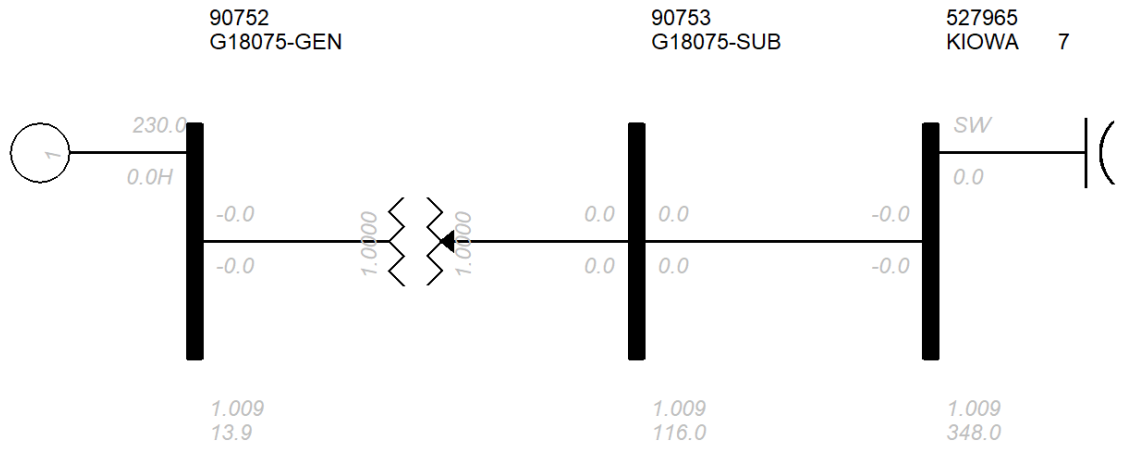

Figure 11-7: GEN-2018-075 (WP) Tertiary Point of Interconnection

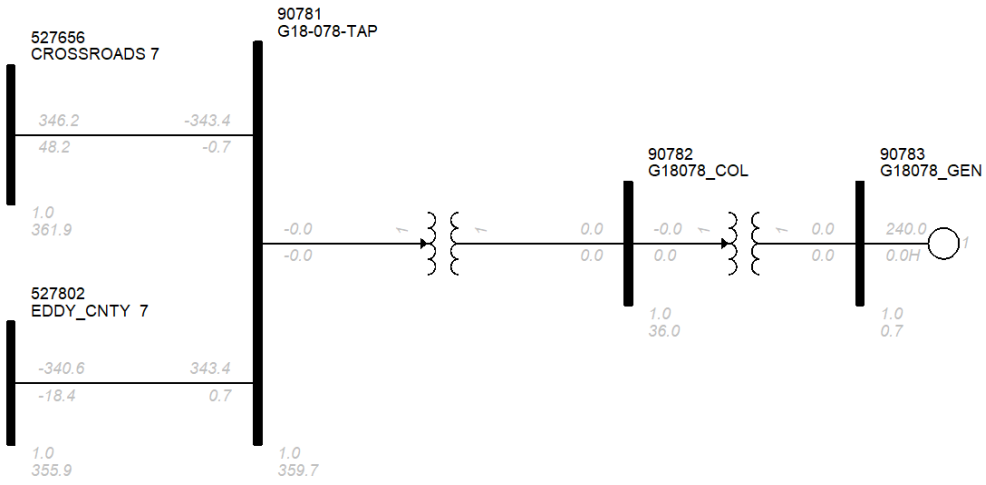

Figure 11-8: GEN-2018-078 Primary Point of Interconnection

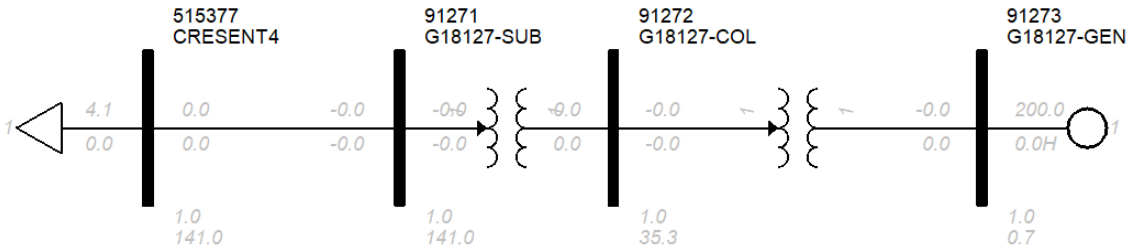

Figure 11-9: GEN-2018-127 Primary Point of Interconnection