



DEFINITIVE INTERCONNECTION SYSTEM IMPACT STUDY MANUAL

By Generator Interconnection Department

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REVISION HISTORY

DATE	AUTHOR	VERSION	COMMENTS
12/2019	SPP	1.0	DISIS Manual
6/2020	TSM	1.1	Model Acquisition Process & Location
11/2020	GI	1.2	Outdated Information Removed/GIS Dispatch Map Updated

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OVERVIEW

Definitive Interconnection System Impact Studies (DISIS) identify the system constraints, transient instabilities, and over-dutied equipment associated with connecting generation to the transmission system. The impact study and other subsequent interconnection studies identify required transmission owner interconnection facilities, network upgrades and other direct assignment facilities needed to inject power into the grid at each specific point of interconnection.

This manual describes the process SPP uses for its DISIS reports. The study process is operated in accordance with Attachment V of the SPP Open Access Transmission Tariff and applicable SPP business practices.

This DISIS process results in studies posted to SPP.org and distributed to generator interconnection customers and impacted transmission owners. For specific study results, visit <http://opsportal.spp.org/Studies/Gen> (or use this path: SPP.org > Engineering > Generator Interconnection > Study Results and Report postings).

A notification of the DISIS posting is sent to the GI Exploder email. Instructions on how to register are located at <https://www.spp.org/stakeholder-center/exploder-lists/>

To determine when a study is scheduled for posting, visit <http://opsportal.spp.org/Studies/Gen> and look for the “GI studies status and posting” link.

OASIS Apps

- Curtailment Viewer
- DC Tie Viewer
- Price Discounts
- Price Matrix
- Transmission Load Relief

SPP OASIS Archive Map

- > SPP OASIS Archive Page
- > Market System Status
- > Member Related Postings
- > FERC890 Items

Studies Postings



SPP's Generator Interconnection team creates stakeholder value by evaluating impacts of connecting new power sources to the existing transmission system. We facilitate agreements between generation producers and transmission owners while ensuring positive outcomes for the regional power grid.

The following Generator Interconnect studies have been completed and are available.

Generator Interconnection Studies				
Interconnection Queue (Active Requests)				
2019_Feasibility_Studies	2019_Impact_Studies	2019_Facility_Studies	2019_Affected_Systems	GIR Application Form Appendix 3 and Attachments A_B_C
2018_Feasibility_Studies	2018_Impact_Studies	2018_Facility_Studies	2018_Affected_Systems	Guidelines for the SPP GIP Process and Business Practices
2017_Feasibility_Studies	2017_Impact_Studies	2017_Facility_Studies	2017_Affected_Systems	Pending Interim Studies
2016_Feasibility_Studies	2016_Impact_Studies	2016_Facility_Studies	2016_Affected_Systems	SPP Site Control Criteria
2015_Feasibility_Studies	2015_Impact_Studies	2015_Facility_Studies	2015_Affected_Systems	Attachment V Generator Interconnection Procedure (Effective Date 1 July 2019)
2014_Feasibility_Studies	2014_Impact_Studies	2014_Facility_Studies	2014_Affected_Systems	FERC Order Accepting Three-Phase Study Process under new Tariff Revisions. Effective Date 1 July 2019
2013_Feasibility_Studies	2013_Impact_Studies	2013_Facility_Studies	2013_Affected_Systems	GI Studies Status and Posting Notification
2012_Feasibility_Studies	2012_Impact_Studies	2012_Facility_Studies	2012_Affected_Systems	
2011_Feasibility_Studies	2011_Impact_Studies	2011_Facility_Studies	2011_Affected_Systems	
2010_Feasibility_Studies	2010_Impact_Studies	2010_Facility_Studies	2010_Affected_Systems	
2009_Feasibility_Studies	2009_Impact_Studies	2009_Facility_Studies		
2008_Feasibility_Studies	2008_Impact_Studies	2008_Facility_Studies		
2007_Feasibility_Studies	2007_Impact_Studies	2007_Facility_Studies		

If you have questions regarding the DISIS process or a specific DISIS report, please contact the generator interconnection team via Glstudies@spp.org or submit an SPP Request Management System (RMS) ticket (<https://spprms.issuetrak.com/login.asp>). Information about setting up an RMS account is available on SPP.org. (<http://www.spp.org/stakeholder-center/customer-relations/request-management-system/>).

Model requestors may obtain the current base case data in accordance with the SPP Open Access Tariff, Attachment V, Section 2.4 Base Case Data. To request such modeling data, a requestor must utilize SPP's RMS tool by setting up an account and using the "GlobalScape (DocuShare/State Estimator/RA) Access" QuickPick to access the GlobalScape folder where the base case data is stored. Requestors will be instructed to complete a confidentiality agreement if they do not already have one on file with SPP Legal.

Eligible requestors may also obtain SPP models specific to an interconnection request by submitting an RMS ticket and selecting the quick pick "Map/Model Orders, Submit NDA."

Determining which RMS quick pick to use will be based on whether you are requesting specific interconnection models from an SPP interconnection study or if you need the current DISIS models.

SPP DISIS RESULTS

For each DISIS, power flow results are provided in an Excel workbook and stability results are provided in a PDF report, both are labeled and posted to [SPP.org](https://www.spp.org).

The DISIS Results Workbook provides a detailed summary of each interconnection request, assigned interconnection and shared network upgrade cost estimates and descriptions, previously allocated upgrades, and thermal and voltage violations meeting criteria for mitigation. Please use the tab summary to become familiar with how to analyze the workbook.

SPP DISIS RESULTS WORKBOOK TABS

The workbook contains worksheets providing the necessary data to analyze interconnection requests presented within the specific DISIS study cluster.

EXECUTIVE SUMMARY

A summary of total MW amount included in the study, total cost for interconnection and models used for the study.

REVISION HISTORY

Contains description of each report revision.

REQUESTS

Contains summarized information for the current and prior queued interconnection requests (GEN numbers) and the pertinent information about each request included in this DISIS cluster study.

CONSTRAINT SUMMARY

Contains all ERIS and NRIS constraints (non-converge, thermal and voltage) observed for single contingency (N-1) and multi-contingency (P1, P2, etc.) conditions and are summarized in conjunction with associated mitigations.

ASSIGNED UPGRADE COSTS

Cost allocated for Network Upgrades and Transmission Owner Interconnection Facilities.

UPGRADE SUMMARY

Contains summarized information for the current and previously allocated upgrades and their associated details.

ALL THERMAL:

Details for thermal constraints for each Interconnection Request are contained here.

ALL VOLTAGE:

Details for voltage constraints for each Interconnection Request are contained here.

DEFINITIONS

TARIFF DEFINITIONS

These definitions are located in the Attachment V, [SPP Open Access Transmission Tariff](#)

- Definitive Interconnection System Impact Study (DISIS)
- Definitive Interconnection System Impact Study Queue (DISIS Queue)
- Distribution Upgrades
- Interconnection Facilities
- Initial Queue Position
- Interconnection Request
- Interconnection Service
- Point of Interconnection
- Previous Network Upgrade
- Queue
- Network Upgrade
- Control Area
- Energy Resource Interconnection Service
- Network Interconnection Resource Service

GENERAL DEFINITIONS

Current Queue - Interconnection Requests being evaluated in this study (Transfer Case).

Prior Queue - Higher queued active requests from previous study clusters (Base Case).

Group - The interconnection requests are grouped into sixteen (16) active regional groups based on geographical and electrical impacts.

MW Amount - The capacity amount (megawatt) evaluated for each request.

LOIS MW Amount - Limited Operation results based on the criteria listed in GIP 8.4.3, the Interconnection Customer may request additional scenarios for Limited Operation based on higher-queued Interconnection Requests not being placed in service. Please refer to the UPGRADE SUMMARY TAB for power flow constraint mitigation.

Upgrade ID - The identification number that SPP utilizes for each upgrade.

System Intact – N-0, Transmission system with all base case circuits intact.

N-n – Transmission system with all base case circuits closed except “n” circuits.

TDF – Transfer Distribution Factor

DISIS METHODOLOGY

A power flow and transient stability analysis is conducted using a cluster scenario. The scenario includes requests in the DISIS queue that were requested in the previous open season window and all higher-queued generator interconnection requests (GIRs).

The results of load flow analysis include power flow magnitudes and voltage levels under probable contingency conditions. The results of the load flow study are used to identify equipment overloads. If an equipment overload is determined to be impacted by the GIR, a cost allocation of the mitigation will be assigned to the GIR shared by other requests in the study that also impact the facility. The study shall be conducted using both PSS®MUST and the ACCC function of PSS®E.

A transient stability analysis is performed to determine generator unit and system response due to fault events on the system. If a stability issue is determined to be resultant by the GIR, a cost allocation of the mitigation will be assigned to the GIR shared by other requests in the study that also impact the stability issue. The transient stability analysis shall be conducted using PSS®E.

For Interconnection Requests resulting 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 deliverability of the energy to final customers and the associated 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).

DEVELOPMENT OF BASE STUDY MODELS

Models are developed for each study based on the specific needs and requirements of a particular study product. Feasibility studies include steady-state power flow and short-circuit analysis. DISIS studies also include dynamic stability analysis.

POWER FLOW MODEL SET

The SPP Integrated Transmission Plan (ITP) power flow models serve as the starting point for all interconnection studies requiring steady-state power flow analysis. These models typically include:

- Year 1 or 2 Spring, Summer and Winter Peak

- Year 5 Light Load, Summer and Winter Peak
- Year 10 Summer Peak

DYNAMIC STABILITY MODEL SET

The SPP Model Development Working Group (MDWG) dynamic stability models serve as the starting point for all studies requiring dynamic analysis. These models typically include:

- Year 1 Winter Peak
- Year 2 Summer Peak
- Year 10 Summer Peak

SHORT CIRCUIT MODEL SET

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

TYPES OF UPGRADES INCLUDED IN THE BASE MODELS

BASE CASE UPGRADES

Base case upgrades are part of the current SPP Transmission Expansion Plan that have an approved Notification to Construct (NTC) or are in construction stages are assumed to be in-service and are added to the base case models if they are not already included in model.

The generation facilities' in-service dates listed in the report's request tab may need to be delayed until completion of the upgrades listed in the UPGRADES SUMMARY TAB. In some cases, the in-service date is beyond the allowable time a customer can delay. In this case, 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 DISIS interconnection customers.

CONTINGENT UPGRADES

Contingent upgrades are not yet in-service. 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 DISIS 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 generation facilities' in-service dates listed in the report's request tab may need to be delayed until completion of the upgrades listed in the UPGRADES SUMMARY TAB.

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 upgrades identified in SPP planning studies other than the upgrades in the UPGRADES SUMMARY TAB.

In addition to the base case upgrades, prior-queued interconnection requests and their associated upgrades are added to the base case models. These prior-queued interconnection requests are dispatched as energy resource interconnection service (ERIS) resources that sink into each zone in the SPP footprint in proportion to the zone's load. Prior-queued requests for network resource interconnection service (NRIS) are also dispatched in separate NRIS scenarios sinking into the same zone.

CLUSTER SCENARIO

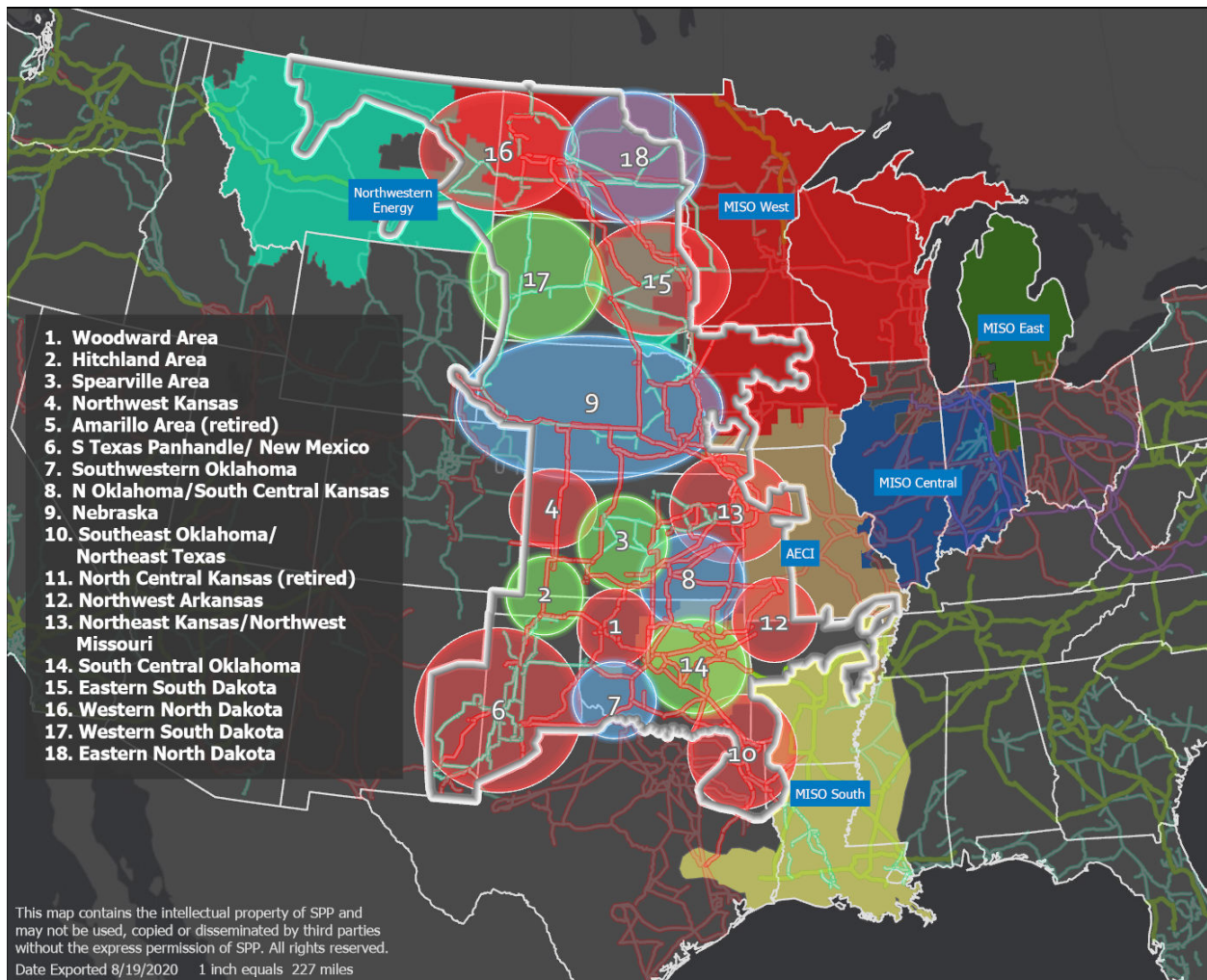
The cluster scenario considers

- Base case
- All interconnection requests in the DISIS study queue
- All generating facilities and network upgrades that, on the date the DISIS is commenced:
 - Are directly connected to the transmission system;
 - Are interconnection to affected systems and may have an impact on the interconnection request;
 - Have a pending higher-queued interconnection request to interconnect to the transmission system; and
 - Have no interconnection queue position but have executed a GIA or requested that an unexecuted GIA be filed with FERC.

REGIONAL GROUPINGS

The GIRs in each DISIS are aggregated into regional groups based on similar geographical and electrical impacts as shown in Figure 1.

Figure 1: Approximate Location of Current Regional Cluster Groups



POWERFLOW STUDY

POWER FLOW MODELS

To simulate and analyze the variety of generation and service types included in a study cluster, three dispatch scenarios are developed utilizing the regional groupings.

- High-Variable Energy Resource (HVER)
- Low-Variable Energy Resource (LVER)
- Network Resource (NR).

Table 1: Generation Dispatch in the Power Flow Models

Model			Generator Dispatch				
Dispatch Scenario	Seasons	Code	Requested Service Type	In Group		Out Group	
				Renew.	Conv.	Renew.	Conv.
HVER	Winter, Summer, Spring, Light	01, 02, 03...18	Both	100%	n/a	20%**	n/a
LVER	Winter and Summer	00	Both	20%	100%	20%	100%
NR	Spring and Light Load	01NR, 02NR, 03NR... 18NR	ERIS	80%	n/a	20%	n/a
			NRIS	100%	100%	20%	20%
	Winter and Summer	00NR	ERIS	20%*	80%	20%*	80%
			NRIS	100%	100%	100%	100%

*Solar 80% in Summer Peak

**For light 10% for DISIS-2016-002 or 0% for DISIS-2017-001 forward

Each Generating Facility is represented in the power flow models as an equivalent generator dispatched at the applicable percentage of the requested service amount with 0.95 power factor capability. The facility modeling includes explicit representation of equivalent generator step-up (GSU) and main project transformer(s) with impedance data provided in the interconnection request. Collector system(s) and transmission lead line(s) shorter than 20 miles are represented as zero-impedance branches. Longer lead lines are explicitly represented.

POWER FLOW ANALYSIS

For all power flow models developed, the ACCC function of PSS®E is used to simulate single-element, breaker-to-breaker, and multi-element outages in all power flow areas of the SPP footprint, as well as other power flow areas external to SPP. The standard SPP contingency and monitored files used in the ITP determine which outages to simulate.

CONSTRAINT IDENTIFICATION

An impact analysis is performed using PSS®MUST to determine the distribution factor (DF) of each of the GIRs upon the constraint (overload). For ERIS, constraints are screened to determine which of the GIRs had at least a 20% DF upon the constraint for outage-based constraints and 3% DF for constraints for system-intact conditions. Constraints that measured these criteria from at least one GIR are considered for transmission reinforcement under ERIS. In addition, stability issues are considered for transmission reinforcement under ERIS. GIRs that have requested NRIS are additionally studied in the NRIS analysis to determine if any constraint measured at least a 3% DF. If so, these constraints are also considered for mitigation under NRIS.

Service Type	Constraint	Type	TDF %
ERIS/NRIS	System Intact / N-n	Voltage	3
ERIS	System Intact / Non-Converge	Thermal	3
ERIS	N-n	Thermal	20
NRIS	System Intact / Non-Converge	Thermal	3
NRIS	n-n	Thermal	3

Constraints that required transmission reinforcement are generally listed in each DISIS RESULTS WORKBOOK (see DISIS RESULTS WORKBOOK Summary) for power flow upgrades. For stability upgrades, the reinforcements are discussed in the stability section of the DISIS report.

THERMAL OVERLOADS

Network constraints are found by using PSS/E AC contingency calculation (ACCC) analysis with PSS/E MUST first contingency incremental transfer capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels previously described.

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

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

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

Appropriate transmission reinforcements are identified to mitigate the constraints.

Interconnection requests that requested 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.

VOLTAGE VIOLATIONS

For non-converged power flow solutions that are determined to be caused by lack of voltage support, appropriate transmission support will be identified to mitigate the constraint.

After all thermal overload and voltage support mitigations are determined; a full ACCC analysis is then performed to determine voltage constraints. The following voltage performance guidelines are used in accordance with the Transmission Owner local planning criteria.

SPP voltage criteria is applicable to all SPP facilities 69 kV and greater in the absence of more stringent criteria:

System Intact	Contingency
0.95 – 1.05 per unit	0.90 – 1.05 per unit

Areas and specific buses having more-stringent voltage criteria:

Areas/Facilities	System Intact	Contingency
AEPW – all buses EMDE High Voltage	0.95 – 1.05 per unit	0.92 – 1.05 per unit
WERE Low Voltage	0.95 – 1.05 per unit	0.93 – 1.05 per unit
WERE High Voltage	0.95 – 1.05 per unit	0.95 – 1.05 per unit
TUCO 230 kV Bus #525830	0.925 – 1.05 per unit	0.925 – 1.05 per unit
Wolf Creek 345 kV Bus #532797	0.985 – 1.03 per unit	0.985 – 1.03 per unit

The constraints identified through the voltage scan are screened for the following for each interconnection request: 3% DF on the contingent element and 2% change in per unit voltage. In certain conditions, engineering judgement was used to determine whether or not a generator had impacts to voltage constraints.

Constraints and associated mitigations for each Interconnection Request are summarized in the CONSTRAINTS SUMMARY TAB of the SPP DISIS RESULTS WORKBOOK. Details are contained in the G-T tab and the G-V tab of the SPP DISIS RESULTS WORKBOOK. Cost allocation for the Cluster Scenario is found in ASSIGNED UPGRADE COSTS tab of the SPP DISIS RESULTS WORKBOOK.

LIMITED OPERATION

Limited Operation results are listed in the REQUESTS tab of the SPP DISIS RESULTS WORKBOOK. While these results are based on the criteria listed in GIP 8.4.3, the Interconnection Customer may request additional scenarios for Limited Operation based on higher-queued Interconnection Requests not being placed in service.

DYNAMIC STABILITY STUDY

DYNAMIC STABILITY MODELS

For each regional group, all interconnection requests are dispatched at 100% of maximum capability. The remote groups are dispatched at 20% output for VERs and 100% output for conventional resources. The output of these requests is distributed across the SPP footprint by offsetting existing generation. Specific adjustments may be made in order to assess stability limits or specific scenarios.

Each generating facility is represented in the dynamic stability models as an equivalent generator dispatched at the applicable percentage of the requested service amount with 0.95 power factor capability. The facility modeling includes explicit representation of equivalent GSU and main project transformer(s), with impedance data provided in the interconnection request. Equivalent collector system(s) and transmission lead line(s) impedances are also explicitly modeled for dynamic stability analysis.

DYNAMIC STABILITY ANALYSIS

For all stability models developed, a transient stability analysis will be performed to determine generator unit response due to fault events on the system. The stability analysis includes new transmission reinforcements that were determined to be necessary by the power flow analysis.

The following TPL-001-4 fault event categories will be simulated in the dynamic stability analysis:

- P1-2: Three-phase transmission circuit fault with reclosure
- P1-3: Three-phase transformer fault without reclosure
- P4-2: Single-phase transmission circuit fault with delayed clearing without reclosure
- P4-3: Single-phase transformer fault with delayed clearing without reclosure
- P6-1: Prior outage followed by three-phase transmission circuit fault with reclosure
- P6-2: Prior outage followed by three-phase transformer fault without reclosure

The transient stability analysis will evaluate:

- System stability in response to fault events
- Compliance of Current Queue and Prior Queue with FERC Order 661-A
- Adherence to the SPP Disturbance Performance Requirements
- Post event voltage recovery within the SPP voltage criteria

STABILITY & SHORT CIRCUIT ANALYSIS

A stability and short-circuit analysis was conducted for each interconnection request using modified versions of the MDWG models' dynamic cases. The stability analysis assumes that all upgrades identified in the power flow analysis are in-service unless otherwise noted in the individual group stability study.

For each group, the interconnection requests are studied at 100% nameplate output while the other groups are dispatched at 20% output for variable energy resource (VER) requests and 100% output for other requests. The output of the interconnection customer's facility is offset in each model by a reduction in output of existing online SPP generation.

A synopsis is included for each group. The detailed stability study for each group can be found in the DISIS report.

A preliminary short-circuit analysis was performed for this study and will be refined in the Interconnection Facilities Study with any additional required upgrades and cost assignment identified at that time.

AFFECTED SYSTEMS COORDINATION

The following procedures are in place for coordination of affected systems.

Impacts on Associated Electric Cooperative Inc. (AECI) – For any observed violations of thermal overloads on AECI facilities, SPP will notify AECI SPP to evaluate the violations for impacts on its transmission system.

Impacts on Midcontinent Independent System Operator (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. All potential impacts are available upon request.

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. MPC will then evaluate the interconnection requests for impacts. All potential impacts are available upon request.

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.

FIRST-TIER EXTERNAL AREAS FACILITIES 115 KV AND GREATER

Area	System Intact	Contingency
EES-EAI	0.95 – 1.05 per unit	0.90 – 1.05 per unit
LASN		
EES		
AMMO		
CLEC		
LAFB		
LEPA		
XEL		
MP		
SMMPA		
GRE		
OTP		
ALTW		
MEC		
MDU		
DPC		
ALTE		
OTP-H (115kV+)	0.97 – 1.05 per unit	0.92 – 1.10 per unit
SPC	0.95 – 1.05 per unit	0.95 – 1.05 per unit

DETERMINATION OF COST ALLOCATION FOR NETWORK UPGRADES

Cost allocation of network upgrades for wind GIRs are determined using the spring model. Cost allocation of network upgrades of peaking units is determined using the summer peak model. A PSS®MUST sensitivity analysis is performed to determine the DF, a distribution factor with no contingency that each GIR had on each new upgrade. The impact each GIR had 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 there are three GIRs: X, Y and Z, responsible for the costs of Upgrade Project 1. Given their respective power transfer distribution factors (PTDFs) for the project have been determined, the cost allocation for GIR X for Upgrade Project 1 is found by the following set of steps and formulas:

- Determine an impact factor on a given project for all responsible GI requests:
 - *Request X Impact Factor on Upgrade Project 1 = PTDF (%) (X) * MW(X) = X1*
 - *Request Y Impact Factor on Upgrade Project 1 = PTDF (%) (Y) * MW(Y) = Y1*
 - *Request Z Impact Factor on Upgrade Project 1 = PTDF (%) (Z) * MW(Z) = Z1*
- Determine each request's allocation of cost for that particular project:
- *Request X's Project 1 Cost Allocation (\$) = $\frac{\text{Network Upgrade Project 1 Cost (\$)} \times X1}{X1+Y1+Z1}$*
- Repeat previous for each responsible GIR 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. Costs assigned to each GIR are generally listed in the ASSIGNED UPGRADE COSTS tab of the SPP DISIS RESULTS WORKBOOK.

RE-STUDY

SPP shall notify the customer in writing if a re-study is required due to a higher-queued project dropping out of the queue, a modification of a higher-queued project, or more than one GIR moving forward into the interconnection facility study phase. Any re-study cost will be borne by the interconnection customer. The customer is responsible for prepaying the cost of the re-study.

GLOSSARY OF TERMS

Term	Definition
DF	Distribution Factor
DISIS	Definitive Interconnection System Impact Study
ERIS	Energy Resource Interconnection Service
ESR	Energy Storage Resource
FERC	Federal Energy Regulatory Commission
GIA	Generator Interconnection Agreement
GIP	Generator Interconnection Procedures
GIR	Generator Interconnection Request
IFS	Interconnection Facilities Study
NRIS	Network Resource Interconnection Service
OATT	Open Access Transmission Tariff
POI	Point of Interconnection
PTDF	Power Transfer Distribution Factor
SPP	Southwest Power Pool
TO	Transmission Owner

REFERENCE DOCUMENTS

The following reference materials are available at www.spp.org:

[SPP Open Access Transmission Tariff](#)

Generator Interconnection Procedures (Attachment V)

[SPP Business Practices](#)

7250 Generator Interconnection Service

7300 Guideline for Clarifying Application of the SPP Generator Interconnection Procedures

[SPP Planning Criteria](#)

[Seams Agreements](#)

AECI

ERCOT

MISO

Peak

Saskatchewan Power

SWPA

TVA

SPP-MISO GI [Coordination Document](#)

[SPP Disturbance Performance Requirements](#)

CURTAILMENT AND SYSTEM RELIABILITY

DISIS report results do not guarantee operation for all periods of time. Although studies analyzed many of the most probable contingencies, they are not an all-inclusive list and cannot account for every operational situation. 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.