



**INTERCONNECTION
FACILITIES STUDY
REPORT**

GEN-2018-008

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2018-008 is for a 252 MW generating facility located in McIntosh, ND. The Interconnection Request was studied in the DISIS-2018-001 Impact Study for ER/NR. The Interconnection Customer's requested in-service date is June 1, 2025.

The interconnecting Transmission Owner, Basin Electric Power Cooperative (BEPC), performed a detailed IFS at the request of SPP. The full report is included in Appendix A. SPP has determined that full Interconnection Service will be available after the assigned Transmission Owner Interconnection Facilities (TOIF), Non-Shared Network Upgrades, Shared Network Upgrades, Contingent Network Upgrades, and Affected System Upgrades that are required for full interconnection service are completed.

The primary objective of the IFS is to identify necessary Transmission Owner Interconnection Facilities, Network Upgrades, other direct assigned upgrades, cost estimates, and associated upgrade lead times needed to grant the requested Interconnection Service.

PHASE(S) OF INTERCONNECTION SERVICE

It is not expected that Interconnection Service will occur in phases. However, full Interconnection Service will not be available until all Interconnection Facilities and Network Upgrade(s) can be placed in service.

COMPENSATION FOR AMOUNTS ADVANCED FOR NETWORK UPGRADE(S)

FERC Order ER20-1687-000 eliminated the use of Attachment Z2 revenue crediting as an option for compensation. The Incremental Long Term Congestion Right (ILTCR) process will be the sole process to compensate upgrade sponsors as of July 1st, 2020.

INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES

The Generating Facility is proposed to consist of Seventy-five (75) 3.4 MW GE 3.0-140 Wind Turbines for a total generating nameplate capacity of 252 MW.

The Interconnection Customer's Interconnection Facilities to be designed, procured, constructed, installed, maintained, and owned by the Interconnection Customer at its sole expense include:

- 34.5 kV underground cable collection circuits;
- 34.5 kV to 345 kV transformation substation with associated 34.5 kV and 345 kV switchgear;
- Two 345/34.5 kV 88/118/147 MVA (ONAN/ONAF/ONAF) step-up transformers to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 0.1 mile overhead kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 345 kV bus at existing Transmission Owner substation ("Groton-Leland Olds 345kV Line") that is owned and maintained by Transmission Owner;
- All transmission facilities required to connect the Interconnection Customer's substation to the POI;
- Equipment at the Interconnection Customer's substation necessary to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 95% lagging and 95% leading in accordance with Federal Energy Regulatory Commission (FERC) Order 827. The Interconnection Customer may use inverter manufacturing options for providing reactive power under no/reduced generation conditions. The Interconnection Customer will be required to provide documentation and design specifications demonstrating how the requirements are met; and,
- All necessary relay, protection, control and communication systems required to protect Interconnection Customer's Interconnection Facilities and Generating Facilities and coordinate with Transmission Owner's relay, protection, control and communication systems.

TRANSMISSION OWNER INTERCONNECTION FACILITIES AND NON-SHARED NETWORK UPGRADE(S)

To facilitate interconnection, the interconnecting Transmission Owner will perform work as shown below necessary for the acceptance of the Interconnection Customer’s Interconnection Facilities.

Table 1 and **Table 2** lists the Interconnection Customer’s estimated cost responsibility for Transmission Owner Interconnection Facilities (TOIF) and Non-Shared Network Upgrade(s) and provides an estimated lead time for completion of construction. The estimated lead time begins when the Generator Interconnection Agreement has been fully executed.

Table 1: Transmission Owner Interconnection Facilities (TOIF)

Transmission Owner Interconnection Facilities (TOIF)	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>Transmission Owner's Groton-Leland Olds 345kV GEN-2018-008 Interconnection (TOIF) (BEPC) (UID156037): Facilitate the interconnection of GEN-2018-008 Estimated Lead Time: 66 Months</u>	\$2,875,664	100.00%	\$2,875,664
Total	\$2,875,664		\$2,875,664

Table 2: Non-Shared Network Upgrade(s)

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>Transmission Owner's Groton-Leland Olds 345kV Line Tap (DISIS-2018-001) (UID156038): Facilitate the interconnection of GEN-2018-008 Estimated Lead Time: 66 Months</u>	Eligible	\$33,290,093	100.00%	\$33,290,093
Total		\$33,290,093		\$33,290,093

SHARED NETWORK UPGRADE(S)

The Interconnection Customer’s share of costs for Shared Network Upgrades is estimated in **Table 3** below.

Table 3: Interconnection Customer Shared Network Upgrade(s)

Shared Network Upgrades Description	ILTCR	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>WAPA's Groton to Bristol 115 kV Rebuild (UID 158559): Rebuild the existing Groton to Bristol 115 kV 21.3 miles line with a minimum summer emergency rating of 128 MVA (WAPA) Estimated Lead Time: 48 Months</u>	Eligible	\$14,565,000	87.47%	\$12,739,874
<u>WAPA's Summit to Bristol 115 kV Rebuild (UID158560): Rebuild the existing Summit to Bristol 115 kV 32.56 mile line with a minimum summer emergency rating of 124 MVA Estimated Lead Time: 68 Months</u>	Eligible	\$28,559,000	87.47%	\$24,980,299
<u>WAPA's Summit to Watertown 115 kV Rebuild (UID158554): Rebuild the existing Summit to Watertown 115 kV 30.7 mile line with a minimum summer emergency rating of 116 MVA Estimated Lead Time: 36 Months</u> *Per TO feedback, this upgrade is no longer necessary as the current line rating meets the minimum requirement.	Ineligible	\$0	0%	\$0
Total		\$43,124,000		\$37,720,173

All studies have been conducted assuming that higher-queued Interconnection Request(s) and the associated Network Upgrade(s) will be placed into service. If higher-queued Interconnection Request(s) withdraw from the queue, suspend or terminate service, the Interconnection Customer’s share of costs may be revised. Restudies, conducted at the customer’s expense, will determine the Interconnection Customer’s revised allocation of Shared Network Upgrades.

CONTINGENT NETWORK UPGRADE(S)

Certain Contingent Network Upgrades are **currently not the cost responsibility** of the Interconnection Customer but will be required for full Interconnection Service.

Table 4: Interconnection Customer Contingent Network Upgrade(s)

Contingent Network Upgrade(s) Description	Current Cost Assignment	Estimated In-Service Date
N/A		

Depending upon the status of higher- or equally-queued customers, the Interconnection Request’s in-service date is at risk of being delayed or Interconnection Service is at risk of being reduced until the in-service date of these Contingent Network Upgrades.

AFFECTED SYSTEM UPGRADE(S)

To facilitate interconnection, the Affected System Transmission Owner will be required to perform the facilities study work as shown below necessary for the acceptance of the Interconnection Customer's Interconnection Facilities. **Table 5** displays the current impact study costs provided by either MISO or AECI as part of the Affected System Impact review. The Affected System facilities study could provide revised costs and will provide each Interconnection Customer's allocation responsibilities for the upgrades.

Table 5: Interconnection Customer Affected System Upgrade(s)

Affected System Upgrades Description	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>MPC's Wilton-Winger 230 kV Structure Raises, Maximum conductor rating is 444 MVA</u>	\$1,000,000	67.4%	\$674,325
<u>MPC/GRE's J897POI-Prairie 230 kV Terminal Upgrade (478 MVA limit)</u>	\$500,000	100%	\$500,000
<u>MPC/OTP's Jamestown-Center 345 kV Structure Raises, Maximum conductor rating is 1595.4 MVA</u>	\$1,000,000	86.2%	\$862,994
<u>MPC's Prairie-Walle 230 kV Structure Raises, Maximum conductor rating is 444 MVA</u>	\$500,000	72.3%	\$361,620
<u>MPC's Prairie-Lake Ardoch 230 kV Structure Raises, Maximum conductor rating is 444 MVA</u>	\$1,000,000	68.8%	\$688,309
<u>MPC's Winger-Walle 230 kV Structure Raises, Maximum conductor rating is 444 MVA</u>	\$1,000,000	71.9%	\$719,964
<u>MPC's Drayton-Lake Ardoch 230 kV Structure Raises, Maximum conductor rating is 444 MVA</u>	\$1,000,000	68.2%	\$682,715
<u>OTP's State-State Non-Convergence Audubon MSC: 1x50 230 MVAR</u>	\$1,000,000	41.9%	\$419,069
<u>XEL's Steady-State Voltage Bison 345 kV MSC: Additional 1x75 MVAR</u>	\$1,500,000	41.9%	\$628,603
<u>OTP's Steady-State Voltage Audubon 230 kV MSC: 2x50 MVAR</u>	\$2,000,000	41.9%	\$838,137
<u>MPC's Steady-State Voltage Edinburg 115 kV MSC: 2x10 MVAR</u>	\$1,000,000	100%	\$1,000,000
Total	\$11,500,000		\$7,375,736

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 252 MW can be granted. Full Interconnection Service will be delayed until the TOIF, Non-Shared NU, Shared NU, Contingent NU, Affected System Upgrades that are required for full interconnection service are completed. The Interconnection Customer’s estimated cost responsibility for full interconnection service is summarized in the table below.

Table 6: Cost Summary

Description	Allocated Cost Estimate
Transmission Owner Interconnection Facilities Upgrade(s)	\$2,875,664
Non-Shared Network Upgrade(s)	\$33,290,093
Shared Network Upgrade(s)	\$37,720,173
Affected System Upgrade(s)	\$7,375,736
Total	\$81,261,666

Use the following link for Quarterly Updates on upgrades from this report: <https://spp.org/spp-documents-filings/?id=18641>

A draft Generator Interconnection Agreement will be provided to the Interconnection Customer consistent with the final results of this IFS report. The Transmission Owner and Interconnection Customer will have 60 days to negotiate the terms of the GIA consistent with the SPP Open Access Transmission Tariff (OATT).

APPENDICES

**A: TRANSMISSION OWNER'S INTERCONNECTION FACILITIES STUDY
REPORT AND NETWORK UPGRADES REPORT(S)**

See next page for the Transmission Owner's Interconnection Facilities Study Report and Network Upgrades Report(s).

Network Upgrade Facilities Study Report

*Southwest Power Pool, Inc. DISIS-2018-001
Groton-Bristol 115-kV
Transmission Line Rebuild*

(DISIS-2018-001)



**Western Area
Power Administration**

Upper Great Plains Region (WAPA-UGP)

December 2023





1.0 Background:

The Western Area Power Administration Upper Great Plains Region (WAPA-UGP¹) received a request from for a Network Upgrade Facilities Study in accordance with the Southwest Power Pool Inc. (SPP) Open Access Transmission Tariff (Tariff). The SPP DISIS-2018-001 study identified the need to increase the rating of the WAPA-UGP Groton-Bristol 115-kV Transmission Line. WAPA-UGP's understanding is that this Network Upgrade has been allocated between SPP generator interconnection requests GEN-2018-039 and GEN-2018-008. The Point of Interconnection (POI) for GEN-2018-039 will be at WAPA-UGP's Edgeley Substation. The POI for GEN-2018-008 will at a Basin Electric Power Cooperative owned facility.

This Network Upgrade Facilities Study does not address transmission service or any delivery component of transmission service.

2.0 Study Requirements:

This Facilities Study includes an evaluation of the following:

- 2.1** Prepare/develop a substation layout, perform a preliminary bus design, and determine all electrical equipment requirements to accommodate the request. Develop/compile cost estimates for all WAPA-UGP labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.
- 2.2** Review and document any other interconnection/control area requirements. Document these additional requirements (such as indication/metering, monitoring, control, relaying) and include these in the cost estimate.
- 2.3** Determination of need to develop an Operating Guide for WAPA-UGP's Dispatch to document the conditions under which the new Generating Facility must be operated to protect against unacceptable pre- or post-contingent transient voltage and loading conditions.
- 2.4** Develop an overall time schedule for completion of the necessary addition/modifications.

3.0 Study Results:

The following results document the analysis of the addition of the Generating Facility to WAPA-UGP's transmission system and fulfill the tasks outlined in Section 2.0 above:

- 3.1 Required Facility Upgrades by WAPA-UGP:** WAPA-UGP has determined that following additions are required to maintain a safe and reliable interconnection to WAPA-UGP's transmission system:

¹ WAPA-UGP is also referred to as "Western-UGP" in the SPP Tariff.



- Rebuild the 21.3-mile Groton-Bristol 115-kV Transmission Line

The line rebuild will require new structures and conductor along the existing right-of-way to achieve the required rating of 139 MVA.

WAPA-UGP is not the Transmission Owner (TO) of the Bristol Substation terminal equipment and bus.

WAPA-UGP's estimated cost for labor, overhead, materials, construction, and other miscellaneous costs to rebuild WAPA-UGP's Groton-Bristol 115-kV Transmission Line is outlined in Attachment A. The total cost is estimated at \$14,565,000.

3.2 Contractual Agreements:

Pursuant to the SPP Tariff, SPP and the POI TOs will need to execute Generator Interconnection Agreements (GIAs) (or initially an Interim GIA, if applicable, with a subsequent execution of a GIA) with Interconnection Customer (IC) for the interconnection of the Generating Facilities. WAPA-UGP's understanding is that after execution of the GIAs, SPP will issue a Notice to Construct (NTC) to WAPA-UGP for the portion of this Network Upgrade not allocated within a GIA to the IC. A Facilities Construction Agreement (FCA) will need to be executed between WAPA-UGP, SPP, and the IC. The GIA and FCA, which discuss the construction and interconnection aspects of this project, will need to be developed and offered by SPP, pursuant to their obligations and procedures under the SPP Tariff, and forwarded to the Network Upgrade TO and IC for review and signature. A payment schedule based on design, procurement, and construction activities will be included in the GIA and FCA consistent with the SPP Tariff provisions. The IC(s) will be responsible for the actual costs associated with the upgrades to WAPA-UGP'S Groton-Bristol 115-kV Transmission Line, and WAPA-UGP will require advance funding to proceed with the project. Upon completion of the work WAPA-UGP will own, operate, and maintain the modifications and improvements to WAPA-UGP's transmission line.

3.3 Interconnection/Control Area Requirements: N/A

3.4 Schedule:

Attachment A outlines WAPA-UGP's estimated schedule for planning, design and construction of the facilities required to accommodate the necessary Network Upgrades. WAPA-UGP anticipates the rebuild of the Groton-Bristol 115-kV Transmission Line would be completed by March 2028. This schedule is based on the GIA and FCA being executed prior to March 15, 2024, and issuance of the NEPA Finding of No Significant Impact or Record of Decision by February 28, 2026. The schedule is also dependent on outage availability.



3.5 Environmental Review:

WAPA-UGP is a federal agency under the U.S. Department of Energy and is subject to the National Environmental Policy Act (NEPA), 42 U.S.C §4321, et seq., as amended. The Environmental Review for this project, as described in Attachment V, Sections 3.3.5, and 8.6.1, and any other applicable sections of the SPP Tariff, will be coordinated between WAPA-UGP and the customer. WAPA-UGP anticipates an Environmental Assessment level of NEPA review. The Environmental Review is performed at the IC's expense, and those costs are considered direct assigned costs and are ineligible for credits under the SPP Tariff. Until the appropriate NEPA review is completed (issuance of a FONSI, ROD, or other), no construction activities relating to this Network Upgrade and the associated upgrades may commence.

4.0 Facilities Study Cost:

WAPA-UGP will audit the Interconnection Facilities Study costs and provide a summary of costs once the study is completed or the interconnection request is withdrawn.



ATTACHMENT A

REBUILD WAPA-UGP’S GROTON-BRISTOL 115-KV TRANSMISSION LINE

PROJECT ACTIVITY	ESTIMATED START DATE	ESTIMATED COST, MILESTONE PAYMENT DUE
Preconstruction activities – planning, project management, etc.	30 Calendar Days Following GIA and FCA Execution*	\$250,000
Provide staff and other resources to engineer, design, and plan construction	30 Calendar Days Following GIA and FCA Execution*	\$455,000
Development, Solicitation, and Award of Construction Contract(s)	November 1, 2026	\$13,390,000
WAPA-UGP Construction Administration	June 1, 2026	\$150,000
Commissioning, Energization, and construction supervision	March 1, 2027	\$320,000
In-Service (Estimated Completion Date)	March 15, 2028	
TOTAL ESTIMATED COSTS		\$14,565,000**

*Assumes Execution of GIA and FCA NLT March 15, 2024.

**Based on WAPA-UGP’s understanding of the SPP Tariff, these Network Upgrades are considered Capacity Network Upgrades and would be evaluated under Attachment Z2 of the SPP Tariff as Capacity Network Upgrades.



Network Upgrade Facilities Study Report

*Southwest Power Pool, Inc. DISIS-2018-001
Summit-Bristol 115-kV
Transmission Line Rebuild*

(DISIS-2018-001)



**Western Area
Power Administration**

Upper Great Plains Region (WAPA-UGP)

December 2023





1.0 Background:

The Western Area Power Administration Upper Great Plains Region (WAPA-UGP¹) received a request from for a Network Upgrade Facilities Study in accordance with the Southwest Power Pool Inc. (SPP) Open Access Transmission Tariff (Tariff). The SPP DISIS-2018-001 study identified the need to increase the rating of the WAPA-UGP Summit-Bristol 115-kV Transmission Line. WAPA-UGP's understanding is that this Network Upgrade has been allocated between SPP generator interconnection requests GEN-2018-039 and GEN-2018-008. The Point of Interconnection (POI) for GEN-2018-039 will be at WAPA-UGP's Edgeley Substation. The POI for GEN-2018-008 will be at a Basin Electric Power Cooperative (BEPC) owned facility.

This Network Upgrade Facilities Study does not address transmission service or any delivery component of transmission service.

2.0 Study Requirements:

This Facilities Study includes an evaluation of the following:

- 2.1** Prepare/develop a substation layout, perform a preliminary bus design, and determine all electrical equipment requirements to accommodate the request. Develop/compile cost estimates for all WAPA-UGP labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.
- 2.2** Review and document any other interconnection/control area requirements. Document these additional requirements (such as indication/metering, monitoring, control, relaying) and include these in the cost estimate.
- 2.3** Determination of need to develop an Operating Guide for WAPA-UGP's Dispatch to document the conditions under which the new Generating Facility must be operated to protect against unacceptable pre- or post-contingent transient voltage and loading conditions.
- 2.4** Develop an overall time schedule for completion of the necessary addition/modifications.

3.0 Study Results:

The following results document the analysis of the addition of the Generating Facility to WAPA-UGP's transmission system and fulfill the tasks outlined in Section 2.0 above:

- 3.1 Required Facility Upgrades by WAPA-UGP:** WAPA-UGP has determined that following additions are required to maintain a safe and reliable interconnection to WAPA-UGP's transmission system:

¹ WAPA-UGP is also referred to as "Western-UGP" in the SPP Tariff.



- Rebuild the 32.56-mile Summit-Bristol 115-kV Transmission Line

The line rebuild will require new structures and conductor along the existing right-of-way to achieve the required rating of 136 MVA.

WAPA-UGP is not the Transmission Owner (TO) of the Bristol Substation terminal equipment and bus.

WAPA-UGP's estimated cost for labor, overhead, materials, construction, and other miscellaneous costs to rebuild WAPA-UGP's Summit-Bristol 115-kV Transmission is outlined in Attachment A. The total cost is estimated at \$28,559,000.

3.2 Contractual Agreements:

Pursuant to the SPP Tariff, SPP and the Point of Interconnection (POI) TOs will need to execute Generator Interconnection Agreements (GIAs) (or initially an Interim GIA, if applicable, with a subsequent execution of a GIA) with Interconnection Customer (IC) for the interconnection of the Generating Facilities. WAPA-UGP's understanding is that after execution of the GIAs, SPP will issue a Notice to Construct (NTC) to WAPA-UGP for the portion of a Network Upgrade not allocated within a GIA to the IC. A Facilities Construction Agreement (FCA) will need to be executed between WAPA-UGP, SPP, and the IC after acceptance of the NTC. The GIA and FCA, which discuss the construction and interconnection aspects of this project, will need to be developed and offered by SPP, pursuant to their obligations and procedures under the SPP Tariff, and forwarded to the Network Upgrade TO and IC(s) for review and signature. A payment schedule based on design, procurement, and construction activities will be included in the GIA and FCA consistent with the SPP Tariff provisions. The IC(s) will be responsible for the actual costs associated with the upgrades to WAPA-UGP'S Summit-Bristol 115-kV Transmission Line, and WAPA-UGP will require advance funding to proceed with the project. Upon completion of the work WAPA-UGP will own, operate, and maintain the modifications and improvements to WAPA-UGP's Summit-Bristol 115-kV Transmission Line.

3.3 Interconnection/Control Area Requirements: N/A

3.4 Schedule:

Attachment A outlines WAPA-UGP's estimated schedule for planning, design and construction of the facilities required to accommodate the necessary Network Upgrades. WAPA-UGP anticipates the rebuild of the Summit-Bristol 115-kV Transmission Line would be completed by August 2028. This schedule is based on the GIA and FCA being executed prior to March 15, 2024, and issuance of the NEPA Finding of No Significant Impact or Record of Decision by February 28, 2026. The schedule is also dependent on outage availability.

3.5 Environmental Review:



WAPA-UGP is a federal agency under the U.S. Department of Energy and is subject to the National Environmental Policy Act (NEPA), 42 U.S.C §4321, et seq., as amended. The Environmental Review for this project, as described in Attachment V, Sections 3.3.5, and 8.6.1, and any other applicable sections of the SPP Tariff, will be coordinated between WAPA-UGP and the customer. WAPA-UGP anticipates an Environmental Assessment level of NEPA review. The Environmental Review is performed at the IC's expense, and those costs are considered direct assigned costs and are ineligible for credits under the SPP Tariff. Until the appropriate NEPA review is completed (issuance of a FONSI, ROD, or other), no construction activities relating to this Network Upgrade and the associated upgrades may commence.

4.0 Facilities Study Cost:

WAPA-UGP will audit the Interconnection Facilities Study costs and provide a summary of costs once the study is completed or the interconnection request is withdrawn.



ATTACHMENT A

REBUILD WAPA-UGP'S SUMMIT-BRISTOL 115-KV TRANSMISSION LINE

PROJECT ACTIVITY	ESTIMATED START DATE	ESTIMATED COST, MILESTONE PAYMENT DUE
Preconstruction activities – planning, project management, etc.	30 Calendar Days Following GIA and FCA Execution*	\$237,000
Provide staff and other resources to engineer, design, and plan construction	30 Calendar Days Following GIA and FCA Execution*	\$407,000
Procure equipment, parts, and control equipment necessary to construct	Nov 15, 2024	\$4,130,000
Development, Solicitation, and Award of Construction Contract(s)	November 1, 2026	\$23,198,000
WAPA-UGP Construction Administration	June 1, 2026	\$150,000
Commissioning, Energization, and construction supervision	January 1, 2028	\$437,000
In-Service (Estimated Completion Date)	December 1, 2029	
TOTAL ESTIMATED COSTS		\$28,559,000**

*Assumes Execution of GIA and FCA NLT March 15, 2024.

**Based on WAPA-UGP's understanding of the SPP Tariff, these Network Upgrades are considered Capacity Network Upgrades and would be evaluated under Attachment Z2 of the SPP Tariff as Capacity Network Upgrades.



Basin Electric Power Cooperative Facility Study Report GEN-2018-008

1. Background:

- 1.1 Per the Generator Interconnection Procedures (GIP), Attachment V, Section 8.11, SPP requests that Basin Electric Power Cooperative (BEPC) perform a facilities study in for the following Interconnection and/or Network Upgrade(s):

Interconnection	156037	Groton-Leland Olds 345kV GEN-2018-008 Interconnection (TOIF) (BEPC)
Interconnection	156038	Groton-Leland Olds 345kV Line Tap (DISIS-2018-001)

2. Study Requirements:

BEPC has performed this Facility Study report in accordance with the Generator Interconnection Procedures (GIP), Attachment V, Section 8.11 for the Interconnection and/or Network Upgrade(s) as described in Section 1.

2.1. The Facility Study report includes an evaluation of the following:

- 2.1.1. Perform/develop a substation layout, perform a preliminary bus design, determine all electrical equipment requirements, and if required determine a suitable site location to accommodate the Request. Develop/compile cost estimates for all BEPC labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.
- 2.1.2. Develop an overall construction schedule for completion of the necessary additions and/or modifications.
- 2.1.3. Point Of Change of Ownership. For the purposes of this Facility Study report, the Point of Change of Ownership location is defined as the take-off structure(s) at the BEPC Substation/Switching Station where the Interconnection Customer's transmission line(s) connects to the take-off structure(s). Interconnection Customer will furnish and install the conductor jumper and insulator assembly to the take-off structure(s).
- 2.1.4. Other Interconnection/Metering Requirements. Basic indication, metering, monitoring, control, and relaying requirements due to a generator interconnection are included in the cost estimate. BEPC's generation metering requirements, as an SPP Transmission Owner, must be met. A list of specific needs will be provided by BEPC once design has progressed.

3. Study Results for GEN-2018-008:

- 3.1. The following results document the analysis of the required facilities for this Interconnection Request as outlined in Section 1 for a new 345kV 3 breaker ring bus which bisects the

Leland Olds 345kV – Groton 345kV transmission line. BEPC has determined that the following additions and improvements are required to maintain a safe and reliable interconnection to BEPC's transmission system.

3.2 Substation/Switchyard

A 345kV 3 breaker ring bus switchyard will be built to accommodate the new generation resource interconnection, reference Figures A1 and A2. All equipment will follow BEPC's internal design standards for minimum BIL, ampacity, and fault capabilities.

The associated work for the new 345kV switchyard includes the following major equipment:

- (1) Control Building
- (3) 345kV Line Take-Off Structure
- (5) 345kV Breaker
- (10) 345kV Breaker Disconnect Switch
- (3) Sets of Line Potential Transformers
- (1) Set of Current Transformers
- (3) Sets of Line Surge Arrestors
- (2) Line Reactors

Additional associated work will include a review and update to relay/protection schemes and SCADA RTU configurations at the Leland Olds 345kV and Groton 345kV line terminals.

3.3 Environmental Requirements

Compliance with all applicable federal, state, and local regulations will be strictly adhered to. Additionally, all applicable and required permits and approvals will be obtained prior to construction. For the purposes of this Facility Study report, it is anticipated that this new 345kV switchyard will require state and local permitting.

3.4 Cost Estimate

GEN-2018-008 Transmission Owner Interconnect Facilities UID 156037	Current Year \$
Line Costs	
Engineering Labor	\$0
Construction Labor	\$0
Reactive Compensation (Labor & Materials)	\$0
Material	\$0
Right of Way	\$0
Line Sub Total	\$0
Station Costs	
Engineering Labor	\$100,000
Construction Labor	\$731,173
Site Property Rights	\$0
Reactive Compensation	\$0
Material	\$1,228,886
Station Sub Total	\$2,060,059
AFUDC	\$0
Contingency	\$815,605
TOIF Subtotal	\$2,875,664

GEN-2018-008 Estimated Costs Non Shared Network Upgrades UID 156038	Current Year \$
Line Costs	
Engineering Labor	\$0
Construction Labor	\$400,000
Reactive Compensation (Labor & Materials)	\$0
Material	\$405,645
Right of Way	\$0
Line Sub Total	\$805,645
Station Costs	
Engineering Labor	\$790,400
Construction Labor	\$7,921,398
Site Property Rights	\$500,000
Reactive Compensation	\$6,971,717
Material	\$7,087,588
Station Sub Total	\$23,271,103
AFUDC	\$0
Contingency	\$9,213,345
Non - Shared Network Upgrades total	\$33,290,093

Total Interconnection Cost	\$36,165,757
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3.5 Construction Schedule

The preliminary project schedule provided is for planning level purposes only and will be adjusted with additional project definition. If it is determined that NEPA and/or ROW condemnation is required, 12-18 months will be added to the In-Service date.

Activity	Duration	Estimated Start	Estimated Finish
Executed GIA-Notice To Proceed Letter	--	Month 0	--
Project Planning	1 Month	Month 0	Month 1
Engineering Design	8-12 Months	Month 3	Month 15
Equipment Procurement	8-63 Months	Month 1	Month 64
Advertise and Award Construction Contracts	2-3 Months	Month 44	Month 47
Construction	15 Months	Month 50	Month 65
Energize and In-Service Date	1 Month	Month 65	Month 66

Figure A1: Proposed Switching Diagram

FIGURE A1
GEN-2018-008

LEGEND:

- EXISTING EQUIPMENT
- NON SHARED NETWORK UPGRADES
- SHARED NETWORK UPGRADES
- TRANSMISSION OWNERS INTERCONNECTION FACILITIES
- INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES
- FUTURE

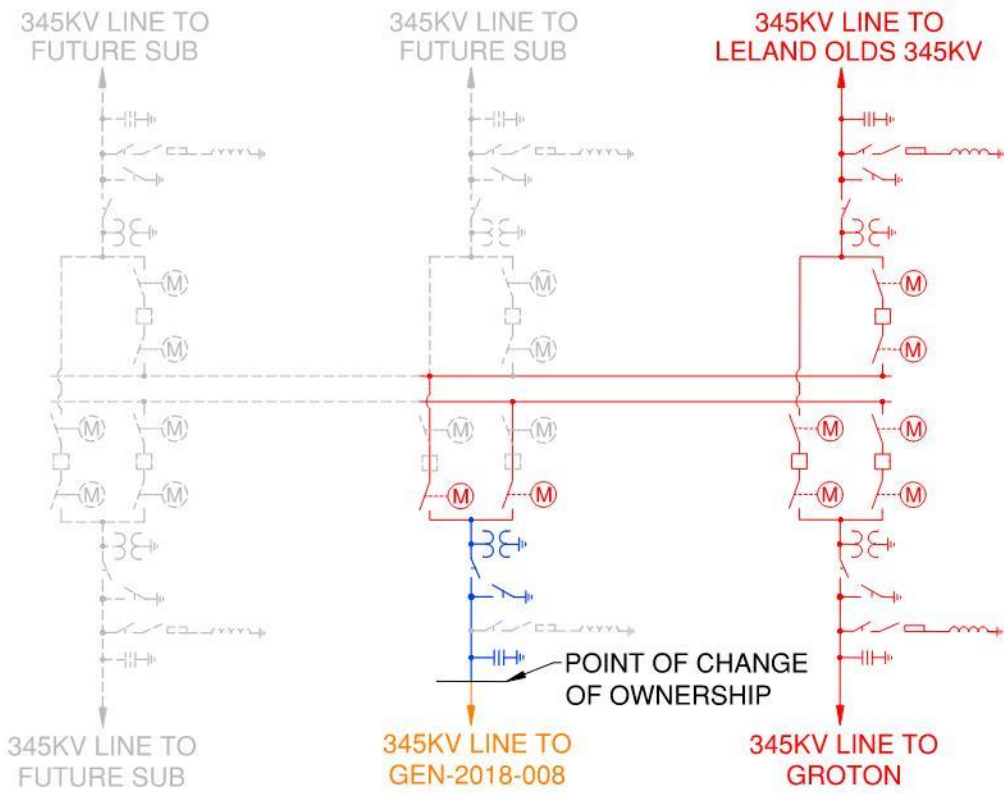
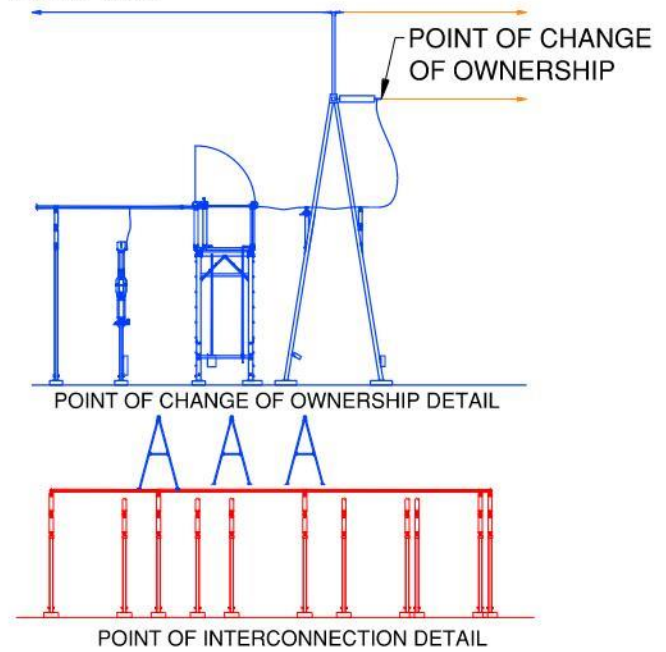
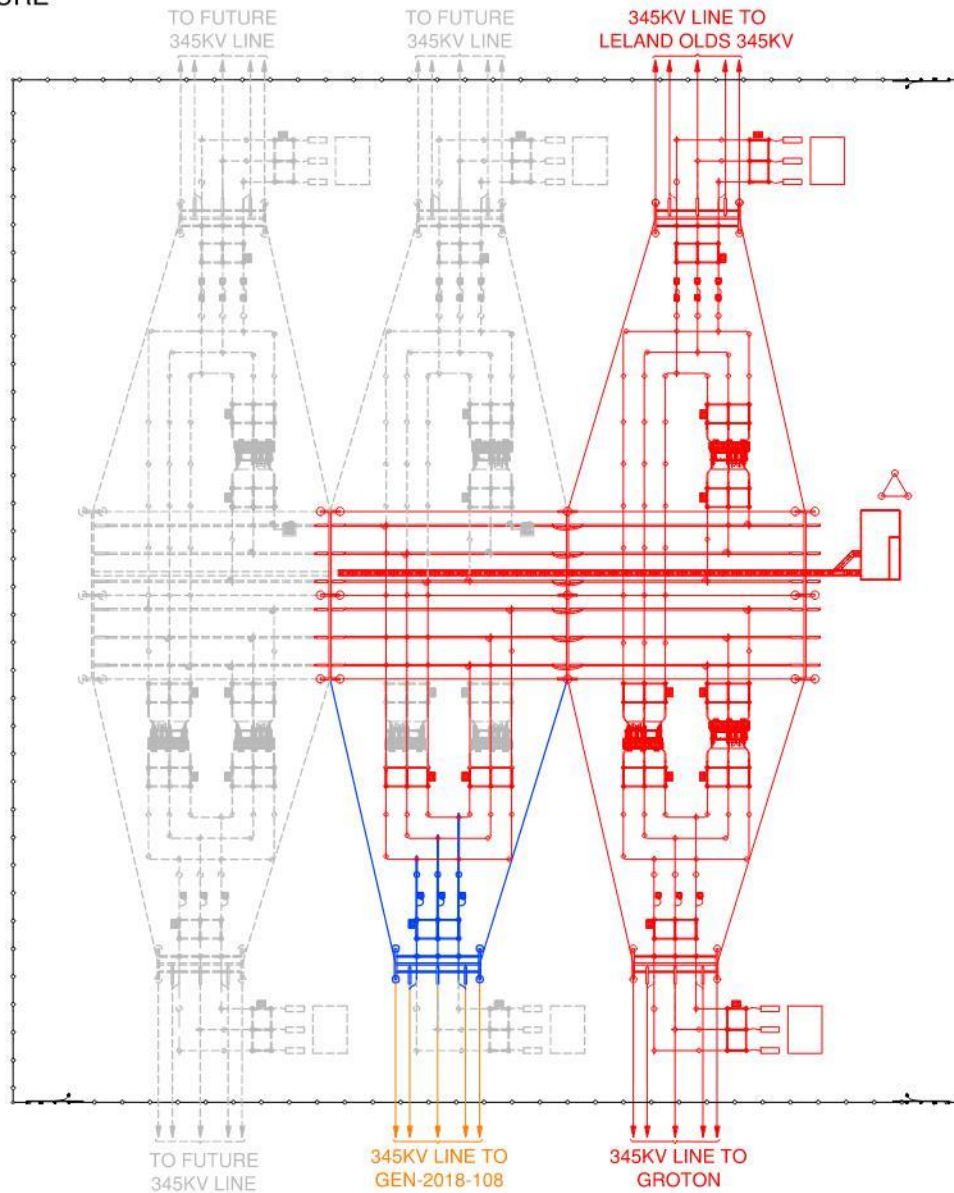


Figure A2: Proposed General Arrangement

FIGURE A2
GEN-2018-008

LEGEND:

- EXISTING EQUIPMENT
- NON SHARED NETWORK UPGRADES
- SHARED NETWORK UPGRADES
- TRANSMISSION OWNERS INTERCONNECTION FACILITIES
- INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES
- FUTURE



ATTACHMENT A
SPP INTERCONNECTION FACILITIES STUDY REQUEST LETTER

September 18, 2023

Subject: Facilities Study Request for DISIS-2018-001

Dear Mr. Trester:

Per the Generator Interconnection Procedures (GIP), SPP requests that Basin Electric Power Cooperative (BEPC) perform facilities study in accordance with Section 8.11 for the following Interconnection and/or Network Upgrade(s):

Upgrade Type	UID	Upgrade Name	DISIS Cost Estimate	DISIS Lead Time
Interconnection	156037	Groton-Leland Olds 345kV GEN-2018-008 Interconnection (TOIF) (BEPC)	\$2,334,054.00	24
Interconnection	156038	Groton-Leland Olds 345kV Line Tap (DISIS-2018-001)	\$20,903,079.00	24
Interconnection	156176	Neset 230kV Substation GEN-2018-010 Interconnection (TOIF) (BEPC)	\$120,000.00	3
Interconnection	156177	Neset 230kV Substation Interconnection Expansion (DISIS-2018-001)	\$0.00	0

** If the upgrade cost studied is higher than 20% of DISIS estimates, please provide justification in the facility report.*

The scope of the Facilities Study is to determine the cost estimates of equipment, engineering, procurement, and construction as well as the associated lead times.

For the completion of this Facilities Study request, please provide a Facilities Study report to SPP within forty-five (45) calendar days to include all of the Interconnection and Network Upgrade(s) listed in the table above. Additionally, please provide an updated and completed Standardized Cost Estimate Report (SCERT) via the Transmission Reporting and Communication (TRAC) tool.

Sincerely,
SPP Generator Interconnection Department
201 Worthen Drive
Little Rock, AR 72223-4936