

LGE-GIS-2019-002

Generation Interconnection Request

System Impact Study Report

Executive Summary

Version 1.0

January 14, 2020

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1. Executive Summary

TranServ International, Inc. (TranServ), as an Independent Transmission Organization (ITO) of Louisville Gas & Electric/Kentucky Utilities (LG&E and KU), has received the following Generation Interconnection (GI) Request to provide a Network Resource Interconnection Service (NRIS) and Energy Resource Interconnection Service (ERIS) to the LG&E and KU Transmission Network. TranServ has evaluated the GI Request listed in Table E-1. This report contains the System Impact Study (SIS) results for GI Request LGE-GIS-2019-002

Table E-1 Request Details

Queue Position	Queue Date	County	State	Max Output (MW) S/W	Point of Inter-connection	In-Service Date	Inter-connection Service Type	Generator Type
LGE-GIS-2019-002	02/06/2019	Ballard	KY	110/110	Grahamville-Wickliffe 161 kV Line	06/01/2022	NRIS/ERIS	Solar

As shown in Table E-1, the LGE-GIS-2019-002 request seeks to interconnect a 110 MW solar generator by tapping the Grahamville-Wickliffe 161 kV line. If the LGE-GIS-2019-002 request is granted, the new generation will have interconnection rights for 110 MW net output both in the summer and winter. The requested in-service date of the LGE-GIS-2019-002 request is June 1, 2022. A one-line diagram of the proposed interconnection is given in Appendix A of the full report. This GI SIS analyzed the impact of this addition, located in Ballard County, Kentucky in accordance with the LG&E and KU Large Generator Interconnection Study Criteria and LG&E and KU Planning Guidelines. Both of these documents are posted on the LG&E and KU Open Access Same-Time Information System (OASIS).

An Ad Hoc Study Group was involved in the study process. Table E-1 documents the Ad Hoc Study Group Comments which relate to independent testing performed by the Ad Hoc Study Group members consistent with the allowance for such testing in the LG&E and KU GI Criteria document.

**Table E-2
 Ad Hoc Study Group Independent Study Comments**

Ad Hoc Group Member	Date Received	Ad Hoc Group Member Comment provided within the October 31, 2019 Deadline
No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request		

The GI request, LGE-GIS-2019-002, is a NRIS and ERIS request and thus was studied as sourcing from the new solar generation interconnected by tapping the Grahamville-Wickliffe 161 kV line and then sinking into the LG&E and KU system in merit order (NRIS) or beyond the LG&E and KU Balancing Authority (BA) equally in four directions (North, South, East, and West) (ERIS). TransServ performed this SIS to determine the impact of this GI on the transmission network. The simulations performed considered steady-state contingencies in Categories P0, P1, P2 EHV, P3, and P4 EHV and stability disturbances in Categories P0 - P7 of the current effective versions of North American Electric Reliability Corporation (NERC) TPL-004 standards and the LG&E and KU Planning Guidelines.

The subject request was evaluated using a 2022 Summer Peak, a 2024 Off Peak and a 2029 Summer Peak steady state powerflow model with roots in the LG&E and KU 2020 Transmission Expansion Plan (TEP) Base Case Study (BCS) models. The GI-2019-002 stability and short circuit models were rooted in LG&E and KU 2019 TEP models. All models used included the 2019 TEP approved projects.

This study included the effect of all earlier queued LG&E and KU GI requests. This study also included the effect of all confirmed Transmission Service Requests (TSRs). There are no planned transmission improvements associated with any earlier queued LG&E and KU GI request. Thus no study to determine whether or not those facilities would be contingent facilities for this request was performed. Representation of the confirmed TSRs may have necessitated representation of associated planned transmission improvements. Thus, it is important to realize that if the planned improvements do not come to fruition, the subject request's impact on the transmission system as identified by this study may become invalid and a revised study may become necessary before GI service can be granted.

1.1 Steady-State Analysis Results

The LKE thermal constraint, which was identified in all summer models, is detailed in Table E-3. No other thermal constraints due to the subject request were found. No voltage constraints due to the subject request were found.

**Table E-3
 LKE Thermal Constraint**

Year / Season	Facility	Rating	Pre Project		Post Project		DF
			MVA	%	MVA	%	
All Summer Scenarios	Wickliffe 161/69 kV Tx	107	1	1%	113	105	99%

1.2 Flowgate Analysis Results

No flowgate constraints due to the subject request were found.

1.3 Contingent Facility Analysis Results

There are no planned transmission improvements associated with any earlier queued LG&E and KU GI request. Thus no study to determine whether or not those facilities would be contingent facilities for this request was performed.

1.4 Short Circuit Analysis Results

The Short Circuit Analysis results indicate that the transmission system has adequate interrupting capabilities to accommodate the addition of the new solar generator.

1.5 Stability Analysis Results

Initially it was assumed that the GI-2019-002 generation would be connected to the transmission system with a 3 breaker ring bus at the POI. The initial results indicated that the GI-2019-002 solar generation would trip in all models due to under-frequency with the customer provided frequency relay settings for most of the P-1 disturbances. Subsequently ITO Option 1 and the Option 2 under frequency relay setting recommendations were developed. With a 3 breaker ring bus interconnection configuration, for all tested P-1 disturbances, all monitored voltages and angles were found to be within acceptable limits with the addition of the 110.0 MW solar generation at the point of interconnection with either the Option 1 or the Option 2 under frequency relay setting modifications with only one exception. The Original Customer provided under frequency relay setting, and the Option 1 and Option 2 under frequency relay setting modifications are documented in Section 5.7.2 of the full report and provided in Tables E-4, E-5 and E-6 below.

Table E-4
Original Customer provided Relay Pickup Time Settings

	Freq range	Relay Pick up time (sec)	Breaker Delay Time (sec)
Customer settings	FRQTPAT-Instance 13 : 40-65 Hz	0.001	0.01
	FRQTPAT-Instance 18 : 57-80 Hz	0.001	0.01
	FRQTPAT-Instance 19 : 55-80 Hz	0.001	0.01

Table E-5
Option 1: Modify Frequency Range Settings

	Freq range
ITO recommended settings	FRQTPAT-Instance 13 : 20-90 Hz
	FRQTPAT-Instance 18 : 20-90 Hz
	FRQTPAT-Instance 19 : 20-90 Hz

Table E-6
Option 2: Modify Relay Pickup Time Settings

	Freq range	Relay Pick up time (sec)	Breaker Delay Time (sec)
ITO recommended settings	FRQTPAT-Instance 13 : 40-65 Hz	0.2	0.01
	FRQTPAT-Instance 18 : 57-80 Hz	0.2	0.01
	FRQTPAT-Instance 19 : 55-80 Hz	0.2	0.01

To reduce the study effort one of the above options was chosen for further analysis. Option one was not further studied. The remainder of the study was performed with the Option 2 modified relay pick up times as detailed in Table E-6. Initially only the P-1 disturbances were analyzed. The results for only one P-1 disturbance, as identified in the full report, showed criteria violations. For this disturbance, the GI-2019-002 generation tripped, which is a criteria violation for a P-1 disturbance, and significant oscillations occurred. It was then determined that if the breaker configuration at the POI were modified from the previously assumed 3 breaker ring bus to a two breaker straight bus configuration, as detailed in the full report, and no reclosing was simulated for the before mentioned problematic disturbance, all P-1 disturbance results were within criteria. Again proceeding with analysis assuming Option 2 settings, no reclosing for the before mentioned problematic disturbance and a two breaker straight bus configuration at the POI all study disturbances were tested (P1 – P7). With the Option 2 settings, no reclosing for the before

mentioned problematic disturbance and a two breaker straight bus configuration at the POI, all disturbance results were found to be within criteria.

It should be noted that the Option 2 mitigations must be verified with the manufacture by the customer for any technical limitation or generator protection issues. The customer provided frequency relay settings would result in unacceptable tripping of the GI-2019-002 solar generation and must be modified.

1.6 Stiffness Verification due to Inverter Based Resource Interconnection

The GI-2019-002 Short circuit ratio (SCR) was found to exceed the minimum requirement of 2.0. Due to the location of the GI-2019-002 POI, the Weighted SCR (WSCR) did not apply. There are no Grid Stiffness constraints to granting the GI-2019-002 GI request.

1.7 Conclusion

The SIS study is based on a two breaker straight bus configuration at the POI. As shown in Table E-3, an LKE thermal constraint was identified in all summer models. This constraint must be mitigated prior to granting the requested service. The customer must work with the TO and ITO during the Facilities Study (FS) to determine mutually agreeable relay settings. Some additional analysis may be required in the FS to verify the agreed settings if they differ from the Option 2 settings. Reclosing must be disabled on the Grahamville to GI-2019-002 POI 161 kV line prior to the GI-2019-002 interconnection. If the customer and TO agree on a more reliable interconnection, a three breaker ring bus configuration can be constructed at the POI. Mitigation is required for the stability criteria violations with a three breaker ring bus interconnection (see full report for more details). No required mitigation or cost of mitigation was studied in this SIS for the three breaker ring bus configuration stability issue. The cost of this mitigation will be determined in the FS if a three breaker ring bus interconnection is required. Thus although some cost information is available, the total cost of a three breaker ring bus configuration interconnection including mitigation is not given in this SIS.

No third party constraints were identified in this study, and no Ad Hoc Study Group member has indicated the need for an Affected System Study.

The need for a network upgrade has been identified. LG&E and KU has provided a cost estimate for the network upgrade. LG&E and KU has determined that a 2 breaker straight bus configuration can be installed at the POI and has provided a good faith estimate of interconnection costs.

A summary of LG&E and KU's non-binding planning level cost estimate for a 2 breaker straight bus POI configuration is given below:

- Generator Owner Facilities: Customer to determine
- Transmission Interconnection Facilities: **\$1,425,944 USD.**
- Network Facilities: **\$ 9,618,715 USD.**
- Distribution Facilities: \$0 USD.

LG&E and KU's good faith estimate of the total cost for all facilities is **\$ 10,372,546 USD** for a 2 breaker straight bus POI configuration. A detailed non-binding planning level cost estimate is given in Section 8 of the Full Report and will be further refined in the Facilities Study.

The cost information which is currently available for the alternative 3 breaker ring bus interconnection is also provided in Section 8 of the Full Report and will be further determined in the Facilities Study.

The full report is available on the LG&E and KU Critical Energy Infrastructure Information (CEII) File Transfer Protocol (FTP) site. See study report title posting on OASIS for instructions for accessing LG&E and KU CEII FTP site. The LG&E and KU secure CEII FTP site URL is: <https://eftws.lge-ku.com/EFTClient/Account/Login.htm>.

LGE-GIS-2019-002
Generation Interconnection Request
Feasibility Study Report
Executive Summary

Project #520

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1. Executive Summary

TranServ International, Inc. (TranServ), as an Independent Transmission Organization (ITO) of Louisville Gas & Electric/Kentucky Utilities (LG&E and KU), has received the following Generation Interconnection (GI) Request to provide Network Resource Interconnection Service (NRIS) and Energy Resource Interconnection Service (ERIS) to the LG&E and KU Transmission Network. After the scoping meeting, the customer decided to proceed with a Feasibility Study (FeS). TranServ has performed the GI FeS to evaluate the impact of the addition of the new solar generation on the LG&E and KU Transmission Network. TranServ has evaluated the GI Request listed in Table E-1. This report contains the FeS results for Generation Interconnection Request LGE-GIS-2019-002.

**Table E-1
Request Details**

Queue Position	Queue Date	County	State	Max Output (MW) S/W	Point of Inter-connection	In-Service Date	Inter-connection Service Type	Generator Type
LGE-GIS-2019-002	02/06/2019	Ballard	KY	110/110	Grahamville-Wickliffe 161 kV line	06/01/2022	NRIS/ERIS	Solar

As shown in Table E-1, LGE-GIS-2019-002 request seeks to interconnect a solar generator by tapping the Grahamville-Wickliffe 161 kV line. The customer may choose to proceed with the GI System Impact Study (SIS) on completion of the FeS and review of the results. The in-service date of the LGE-GIS-2019-002 request is June 01, 2022. A one-line diagram of the proposed interconnection is given in Figure 1-1 of the full report document. This FeS analyzed the impact of this addition, located in Ballard County, in accordance with the LG&E and KU Large Generator Interconnection Study Criteria and LG&E and KU Planning Guidelines. Both of these documents are posted on the LG&E and KU Open Access Same-Time Information System (OASIS).

An Ad Hoc Study Group was not involved in the FeS study process as is consistent with the FeS study procedure given in the LG&E and KU GI Study Criteria document.

The GI request, LGE-GIS-2019-002, was sourced from the new solar generation interconnected by tapping the Grahamville-Wickliffe 161 kV line and then sunk into the LG&E and KU system in merit order (NRIS) or beyond the LG&E and KU Balancing Authority (BA) equally in four directions (North, South, East, and West) (ERIS). TranServ performed this FeS to determine the impact of this GI on the transmission network. This analysis considered the subject request's impact on

system intact (P0 Events), single-event (P1, P2 EHV, and P4 EHV Events) and selected double-event (P3 Events) contingency conditions.

This study included the effect of all earlier queued LG&E and KU GI requests. This study also included the effect of all confirmed Transmission Service Requests (TSRs) except confirmed TSRs which are associated with lower queued GI requests. Representation of these GI and TSR requests may also have necessitated representation of associated planned transmission improvements. Thus, it is important to realize that if the planned improvements do not come to fruition, the subject request’s impact on the transmission system as identified by this study may become invalid and a revised study may become necessary before GI service can be granted.

1.1. Steady-State Analysis Results

No third party potential thermal constraints due to the subject request were identified. No LG&E and KU or third party potential voltage constraints due to the subject request were identified. Table E-2 lists the LG&E and KU facility identified as a potential thermal constraint in both the ERIS and NRIS summer analyses.

**Table E-2
 LG&E and KU ERIS and NRIS Potential Summer Thermal Constraint**

Year / Season	Facility	Rating	Pre Project		Post Project		DF
			MVA	%	MVA	%	
All Summer Scenarios	Wickliffe 161/69 kV Tx	107	1	1%	112	105	99%

The constraint mitigation is needed before the GI-2019-002 in-service date, June 1, 2022 for both ERIS and NRIS.

Table E-3 lists the additional LG&E and KU facility identified as a potential thermal constraint for only the 2022 Summer NRIS analysis. This facility was only identified as a potential constraint in the 2022 analysis and not the 2028 analysis. If this facility is identified similarly in the SIS, LG&E and KU will consider first if an operating guide could be used to mitigate this short term criteria violation and if not this constraint would need to be mitigated prior to the requested service. It is also important to note that the overload is only 0.01 MW. Based on the results of this FeS the Table E-3 facility would not overload after 11/30/2022.

**Table E-3
 LG&E and KU 2022 Summer NRIS Potential Thermal Constraint**

Facility	Rating	Pre Project Loading		Post Project Loading		DF
		MVA	%	MVA	%	
COLEMAN TAP - PADUCAH PRIMARY 161 kV	245	205	84	245.010	100.004	36%

1.2. Flowgate Analysis Results

As given in the LGI study criteria document, the flowgate analysis did not include evaluation of LG&E and KU flowgates. No third party flowgate results were identified as potential constraints to the subject request.

1.3. Short Circuit Analysis Results

The Short Circuit Analysis results indicate that the transmission system has adequate interrupting capabilities to accommodate the addition of the 112.21 MW Solar generator.

1.4. Stability Analysis Results

Since this is a FeS, stability analysis was not a part of the scope of the study. If the customer decides to proceed with the SIS, a stability analysis will be a part of that SIS.

1.5. Conclusion

No third party potential constraints were identified. Potential LG&E and KU thermal constraints as shown in Tables E-2 and E-3 were identified. No LG&E and KU voltage or short circuit constraints were found. If the customer proceeds to the SIS, the SIS results could differ. The customer would need to mitigate any constraints identified in the SIS.

In order to obtain 110 MW injection at the Point of Interconnection (POI), the study determined that the gross generation at the solar plant inverter bus would need to be 112.21 MW. Gross generation of 112.21 MW was modeled for this FeS. The data provided by the customer does not support the 112.21 MW gross generation level. The customer will need to clarify and make consistent, the gross generation at the inverter level as well as the net generation at the POI prior to proceeding with the SIS.

The study determined that the inverters' 0.889 PF capability in conjunction with the 3 MVar switched capacitor is expected to provide at least +/- 0.95 power factor at the POI.

It should be noted that during the SIS phase some third parties may choose to perform an independent affected system study and may identify additional impacts through that study. The customer would also need to work with the impacted third party to mitigate those impacts.

LG&E and KU has provided good faith estimates of network upgrade and interconnection costs. The good faith estimate of network upgrades does not include the cost to mitigate the Table E-3 results. However if the same results are found in the SIS and LG&E and KU determines that an operating guide is not available to mitigate the short term impact, construction of upgrades may be needed. A summary of LG&E and KU's non-binding planning level cost estimates is given below:

- Generator Owner Facilities: Customer to Determine
- Transmission Interconnection Facilities: **\$966,321.**
- Network Interconnection Facilities: **\$8,714,872.**
- Network Upgrade Facilities: **\$2,787,782.**
- Distribution Facilities: **\$0.**

LG&E and KU's good faith estimate of the total cost for facilities is **\$12,468,975.** LG&E and KU has indicated that the mitigation can be completed by May 31, 2022.

Detailed non-binding planning level cost estimates are given in Section 6 of the Full Report.

The full report is available on the LG&E and KU Critical Energy Infrastructure Information (CEII) File Transfer Protocol (FTP) site. See study report title posting on OASIS for instructions for accessing LG&E and KU CEII FTP site. The LG&E and KU secure CEII FTP site URL is: <https://eft.lge-ku.com/EFTClient/Account/Login.htm>.



PPL companies

FS-LGE-GIS-2019-002 Facilities Study Report

May 29, 2020

Study & Preliminary Report Completed By:
LG&E/KU Transmission

Report Prepared By:
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1. Executive Summary

A Facilities Study was performed by LG&E/KU for the following request:

**Table 1
Request Details**

Queue Position	Queue Date	County	State	Max Output (MW) S/W	Point of Inter-connection	In-Service Date	Inter-connection Service Type	Generator Type
LGE-GIS-2019-002	02/06/2019	Ballard	KY	104/104*	Grahamville-Wickliffe161 kV Line	06/01/2023	NRIS/ERIS	Solar

*Customer reduced capacity from 110 to 104 for the facilities study

TranServ as Independent Transmission Organization (ITO) completed a Generator Interconnection (GI) System Impact Study (SIS). The GI SIS analyzed the impact of this Generator Interconnection, located near Louisville, Kentucky, in accordance with the LG&E and KU Large GI Study Criteria document as posted on the LG&E and KU Open Access Same-Time Information System (OASIS). Customer executed a Facility Study Agreement with for the ITO and LG&E and KU to complete a Facilities Study. LG&E and KU Services Company (LG&E-KU) contracted Black & Veatch (BV) to complete a +/-20% cost estimate study for the Generation Interconnect Request GI-2019-002 facility study. The request requires a new interconnection substation that will tap the existing 138 kV Grahamville to Wickliffe line in Ballard County, Kentucky.

The LG&E/KU Open Access Transmission Tariff (OATT) states that the Facilities Study will include a good faith estimate of (i) the cost of Direct Assignment Facilities to be charged to the Eligible Customer, (ii) the Eligible Customer’s appropriate share of the cost of any Network Upgrades, and (iii) the time required to complete such construction and initiate the requested service.

TranServ has reviewed the Facilities Study results from LG&E and KU and prepared this report in accordance with the LG&E and KU OATT.

2. Constraint Identified in the SIS

2.1 Steady State Constraints

In the SIS report, only LG&E and KU 2020 Summer Peak thermal constraints were identified. The LG&E and KU 2020 Summer Peak thermal constraints due to the subject request are shown in Table 2-1.

**Table 2-1
 LG&E and KU Thermal Constraints**

Year / Season	Dispatch	Facility	Rating	Pre Project		Post Project		DF
				MVA	%	MVA	%	
All Summer Scenarios	All	Wickliffe 161/69 kV Tx	107	1	1%	113	105	99%

The above constraint was reevaluated in this facilities study. With reduction of LGE-GIS-2019-002 capacity from 110 MW to 104 MW, no overload is found in this facility study and no mitigation is required for the Wickliffe 161/69 kV transformer overload found in SIS.

2.2 Flowgate Analysis Results

No flowgate constraints due to the subject request were found in the SIS report.

2.3 Contingent Facility Analysis Results

There are no planned transmission improvements associated with any earlier queued LG&E and KU GI request. Thus, no study to determine whether or not those facilities would be contingent facilities for this request was performed.

2.4 Short Circuit Analysis Results

The Short Circuit Analysis results from the SIS indicate that the transmission system has adequate interrupting capabilities to accommodate the addition of the new solar generator

2.5 Stability Analysis Results from SIS

The Stability Analysis Results from the SIS were reviewed along with the stability issues found for the 3-breaker interconnection option in the SIS as part of this facilities study. The 3 breaker configuration was re-evaluated with the latest PSS/E version (33.12.1) that includes a more accurate and improved GI-2019-002 inverter model. Therefore, stability study results from SIS are replaced with facilities stability study results (provided in section 2.6).The stability analysis

was performed for both near term and out year summer peak, summer generation maximization, and light load system conditions with appropriate earlier queued generators included in the model.

2.6 Stability Study Analysis from the Facilities study

TO performed stability simulations considering 3 breaker interconnection option with the latest PSS/E version (33.12.1) and results are provided in this section. The ITO reviewed these results and agree with these results and conclusion.

2.6.1 Results

Criteria violations were identified with the original customer provided under frequency protection settings. The SIS report provides updated under frequency protection option 2 settings and these were implemented in the FS.

Table 2-2-A
Option 2: Modify Relay Pickup Time Settings (From SIS)

	Freq range		Relay Pick up time (sec)	Breaker Delay Time (sec)
ITO recommended settings	FRQTPAT-Instance 13 : 40-65 Hz		0.2	0.01
	FRQTPAT-Instance 18 : 57-80 Hz		0.2	0.01
	FRQTPAT-Instance 19 : 55-80 Hz		0.2	0.01

The initial results indicated that the GI-2019-002 solar generation would trip due to under-voltage with the customer provided voltage relay settings. It was determined that the customer provided relay settings were more stringent than the recovery criteria outlined in the TO performance documentation. The customers relay settings were adjusted as shown below to account for this issue and ensure that PRC-024 criteria is maintained. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

Table 2-2-B
Modify Relay Pickup Time and Voltage Range

MINS	Protection module	Machine Bus Number		ID	Lower Bandwidth	High Bandwidth	Relay pick up Time	Breaker Delay Time
6	VTGTPAT-Used in the SIS	991044	991044	1	0.89	1.8	3	0.01
6	VTGTPAT-Modified for the Facility Study	991044	991044	1	0.8	1.8	4	0.01

Also, criteria violations were identified in the SIS with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

2.6.1.1 Disturbance Evaluation P2-P7

The ITO studied and confirmed the lack of issues with both P1 and P6 contingencies as outlined in the SIS report. Therefore, the analysis consisted of P2-P7 analysis. All monitored voltages and angles as outlined in the SIS study were found to be within acceptable limits with the addition of the 104.0 MW solar generation at the point of interconnection. It was determined that there were no criteria violations for the disturbances evaluated in this analysis.

2.6.1.2 Impedance swing

To address Sections 4.1.2 and 4.3.1.3 of the TPL-001-4 standard, stability analysis was performed to assess tripping due to transient swings. The goal of the apparent impedance swing test is to determine if there are any breaker mis-operations as a result of an apparent impedance swing during the stability simulation. The breakers need to be able to clear the fault during normal or delayed clearing events. However, non-faulted facilities need to remain in service. Distance relays, which are designed to determine if a fault is on the system, could mis-operate due to an apparent impedance swing resulting in tripping of facilities that are not needed in order to clear the fault. These distance relay settings are defined in the SIS report. It was determined that there were no misoperations for the disturbances evaluated in this analysis.

2.6.2 Conclusion

Criteria violations were identified with the original customer provided under voltage and under frequency protection settings. Updated settings are provided in the SIS and FS to alleviate these issues. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

With the newly updated protections settings, criteria violations were identified with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-

002 POI 161 kV line and the Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

The two breaker interconnection option was not considered in this study since a 3 breaker interconnection option (figure 1) shows no need for any additional mitigations other than the study recommended relay settings and it is a more reliable standard interconnection for the LGE and KU system.

When using the ITO and TO recommendations from the SIS and FS. All study disturbance (disturbances as outlined in the SIS study) results were found to be within criteria with the addition of the 104.0 MW solar generation at the point of interconnection.

2.7 Stiffness Verification due to Inverter Based Resource Interconnection

The GIS-2019-002 Short circuit ratio (SCR) was found to exceed the minimum requirement of 2.0. Due to the location of the GIS-2019-002 POI, the Weighted SCR (WSCR) did not apply. There are no Grid Stiffness constraints to granting the GIS2019-002 GI request.

3. Affected System Impacts from SIS

Tables 3-1 and 3-2 from the SIS report documented the Ad Hoc Study Group Comments which relate to independent testing performed by the Ad Hoc Study Group members consistent with the allowance for such testing in the LG&E and KU TSR Criteria document.

**Table 3-1
Ad Hoc Study Group Independent Study Comments**

Ad Hoc Group Member	Date Received	Ad Hoc Group Member Comment provided within the October 31, 2019 Deadline
No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request		

4. Facilities Study Results from LG&E and KU

4.1 Methodology

The following terms are defined in this facilities study report

1. **New Network Facilities (NNF)** - additions, modifications, and upgrades to the Transmission Owner's system required at or beyond the Point of Interconnection (POI) to accommodate the interconnection of the Generating Facility to the Transmission System. It is possible for system network power to flow through NNF equipment, along with generation facility power.
2. **Transmission Interconnection Facilities (TIF)** - all facilities and equipment owned by the Transmission Owner from the Point of Interconnection (POI) to the Point of Change of Ownership (PCO); including any modifications, additions, or upgrades to such facilities and equipment. Transmission Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Generator Upgrades, Stand Alone Network Upgrades, or Network Upgrades. Only generation facility power can flow through TIF equipment.
3. **Generation Owner Facilities** – all facilities and equipment owned by the Interconnection Customer starting at the Point of Change of Ownership (PCO).
4. **Point of Interconnection (POI)** – the point where the transmission interconnection facilities connect to the new network upgrades.
5. **Point of Change of Ownership (PCO)** – the point where the Interconnection Customer's facilities connect to the transmission interconnection facilities.
6. **Distribution Upgrades (Distribution Facilities)**
Article 11 of the LGIA specifies which party (Transmission or Generator Owner) has a construction obligation and who bears the expense of that obligation. Based on the requirements within the LGIA:
 - **Generator Owner Facilities:** The Generator Owner is responsible for building, owning, and maintaining the assets. The Generator Owner bears the expense for these assets.
 - **Transmission Interconnection Facilities (TIF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. The Generator Owner bears the non-refundable expense for these assets (Generation contribution to Transmission).
 - **Network Facilities (NF) (include NNF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. However, the Generator Owner funds the initial expense for the Network Facilities unless LG&E and KU Transmission chooses to fund them. Any funds received from the Generator will be refunded to the Generator,

plus interest, as the Generator takes transmission service, or repayment can be set up over a defined period. The Terms of payment for the Network Facilities will be determined in the negotiation period (identified in the LG&E and KU OATT: Attachment M Section 11) of the LGIA.

- **Distribution Facilities:** LG&E and KU Transmission does not own any Distribution Assets. So, Distribution Asset Costs identified would be reviewed and determined with the local distribution utility.

7. Interconnection Customer (IC) - The Generator Owner.

The LGE-GIS-2019-002 Solar Transmission Estimate was created following the below steps:

- a. Engineering and Project Management costs were estimated. LG&E and KU project Management & Engineering labor were estimated at 20% of the contracted project Management & Engineering labor cost.
- b. Construction Management labor costs were estimated. LG&E and KU Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- c. The Generator Owner facilities are not included in the estimates.
- d. The Transmission Owner's Telecommunications Department provided an estimate for telecom facilities.
- e. Cost estimates were broken down between Company labor, contracted labor, materials, and contingency.
- f. Pricing provided by the vendor was combined with Transmission Owner's burdens and contingency cost
- g. Pricing provided by the Transmission Owner's Telecommunications Department was aggregated in the cost summary table.
- h. The responsibility for costs was determined per the Transmission Owner's *Allocation of Costs for Generator Interconnections* document, effective January 1, 2018, for a new three breaker ring bus configuration. As such, all costs associated with this estimate are categorized as Transmission Interconnect Facilities (TIF). To remain consistent with past Facility Study reports, and to emphasize that all costs will be the sole responsibility of the Interconnection Customer, the cost estimate in Table 4-1: Estimated Costs of Facilities and Section 4.5.2 Cost Estimate Summary includes Transmission Interconnect Facilities (TIF). New Network Facilities will total to \$9,801,317 USD for this scope.

4.2 Major Project Assumptions, Constraints, and Risks

4.2.1 Assumptions and Clarifications

The cost estimates prepared for this interconnect request are based on the following assumptions.

- The IC's interconnection circuit construction and the IC's generation facilities are not included in this study.
- Estimate accuracy is +/- 20%.
- Internal LG&E-KU costs for Project Management & Engineering labor were estimated at 20% of the contracted Project Management & Engineering labor costs.
- Internal LG&E-KU costs for Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- Telecom labor and material costs were provided by LG&E-KU and are assumed to be 100% LG&E-KU costs.
- LG&E-KU burdens and contingency were estimated internally by LG&E-KU.
- All contracted costs presented within this report include 6% escalation on cost, contractor burdens, and markups.
- Union Labor rates were utilized for construction labor.
- Materials are assumed to be tax exempt. No sales taxes are included in the estimate.
- Insurance is included for contracted costs.
- Engineering, Project and Construction Management, and Construction Mobilization/Demobilization costs were allocated between Network Facility (90%) and Transmission Interconnection Facility (10%) costs.

4.2.1.1 Construction

- Temporary construction power is assumed to be provided by LG&E-KU.
- Adequate site access will be provided by the IC.
- Costs for subcontracted site security are included for non-work hours, holidays, and weekends for the duration of construction.
- Costs are included for a part-time onsite Construction Safety manager.
- Temporary laydown, matting, or other improvements are not included.

4.2.1.2 Civil-Site Development

- Site development for the access road, substation pad, and transmission cut-in will be by the IC and is not included in the cost of this estimate. It is assumed that all property purchase, site clearing/grubbing, grading, landscaping, drainage, storm water, and/or erosion control design, permitting, and construction will be provided by the IC. The IC will provide a rough graded and fenced pad with a 20' swing gate per LG&E-KU standards.
- Boundary, topographic, and/or environmental surveys are not included and are assumed to be by the IC.
- Site Planning, Zoning, Easement and/or Real Estate negotiations or approvals are not included and are assumed to be by the IC.
- All environmental and other necessary permits to complete the site development construction will be secured and paid for by the IC.

4.2.1.3 Civil-Structural

- H-frame and lightning mast structures will be comprised of bent plate and will be detail-designed by a steel fabricator, with loads provided by the substation engineer.
- All remaining steel will consist of standard AISC shapes to be detail-designed by the substation engineer.
- Geotechnical soil information was not available at the time of the estimate completion. Black & Veatch completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate.
- Based on the proposed location of the site, it is expected that the site will fall under Seismic Design Category D. Liquefaction was not considered for foundation design estimates.
- The soil conditions are assumed to be conducive for the installation of drilled pier foundations, but will require additional detailing to meet the building code requirements for Seismic Design Category D. Tie spacing is assumed to be 4" on center.
 - The H-frame and H-frame with switch foundations are assumed to be 5' diameter piers extending 22' and 25', respectively.
 - The lightning mast foundations are assumed to be 4' diameter piers extending 18'.

- All substation structures are supported on 3' diameter, 9' long piers, with the exception of the high bus and high disconnect switch structures, which are supported on 12' long piers.
- The control house is supported by (10) 2.5' diameter, 15' long drilled piers.
- The control house is assumed to be constructed at approximately grade elevation. It will not be elevated for flood considerations. No stairs are assumed to be required.

4.2.1.4 Relaying & Communications

- The IC will supply the fiber communication (OPGW) channel between the IC collector substation and the LG&E-KU station.
- The estimate includes costs for the fiber connection from the new LG&E-KU Control House to the H-Frame dead end structure.
- The IC will supply a line protection relay panel in the IC-owned collector substation to interface with the LG&E-KU-owned line protection relay panel in the interconnection station for coordinated protection of the IC line segment.
- LG&E-KU Telecom will design and construct a 195' tall microwave tower to be installed inside the LG&E-KU substation. Physical space has been allocated for the tower in the conceptual substation arrangement.

4.2.2 Project Risks and Constraints

- Geotechnical soil information was not available at the time of the estimate completion. The vendor completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. The site is anticipated to have clay soil over shallow limestone rock and require site grading to balance the station pad elevation. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate. Site soil conditions that differ from anticipated conditions could have significant impact on foundation design and below grade construction.
- No property survey information was available at the time of the conceptual substation design and cost estimate. The location of the network and interconnection facilities were identified based on aerial imagery and partial property parcel information. Changes to the physical location of the facilities could impact costs.

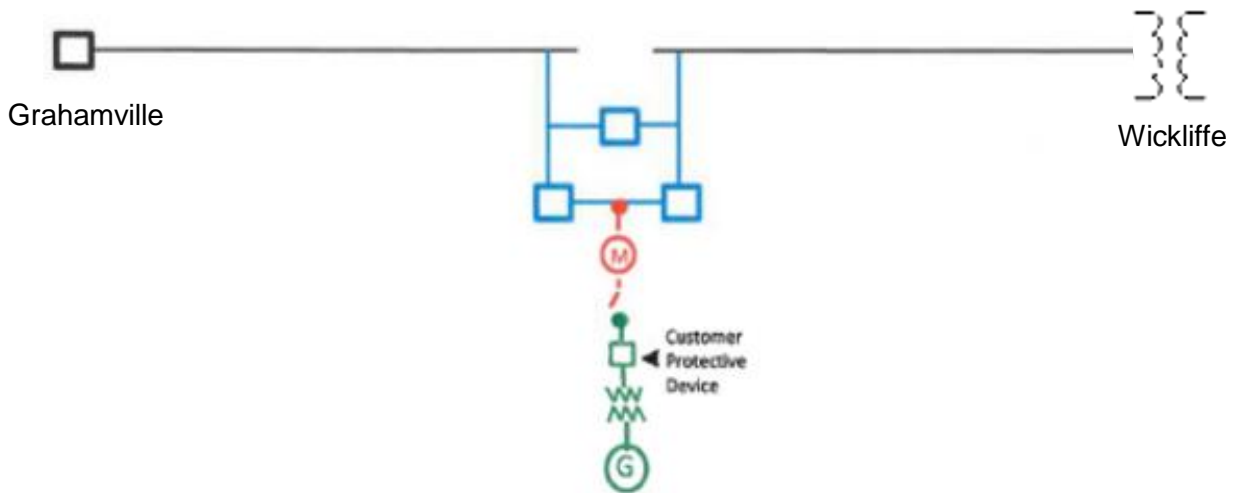
- Material and labor availability at the time of project execution could have significant cost impacts.

4.3 Interconnection Facilities Needs

Figure 1 shows the division of responsibility for a new three breaker ring bus configuration, per the Transmission Owner's *Allocation of Costs for Generator Interconnections* document, effective January 1, 2018.

The new interconnection facility will be constructed adjacent the IC's collector substation. The IC will be responsible for the design, construction, and permitting of the 161kV transmission line from their facilities to the Point of Change of Ownership (PCO) at the LGE-GIS-2019-002.

Figure 1: Point of Interconnection



Legend:

- Black = Existing Transmission Facilities
- Blue = New Network Facilities
- Red = Transmission Interconnection Facilities
- (M) = Interconnection Metering and Associated Equipment
- Green = Generation Facilities
- = Point of Interconnection
- = Point of Change of Ownership

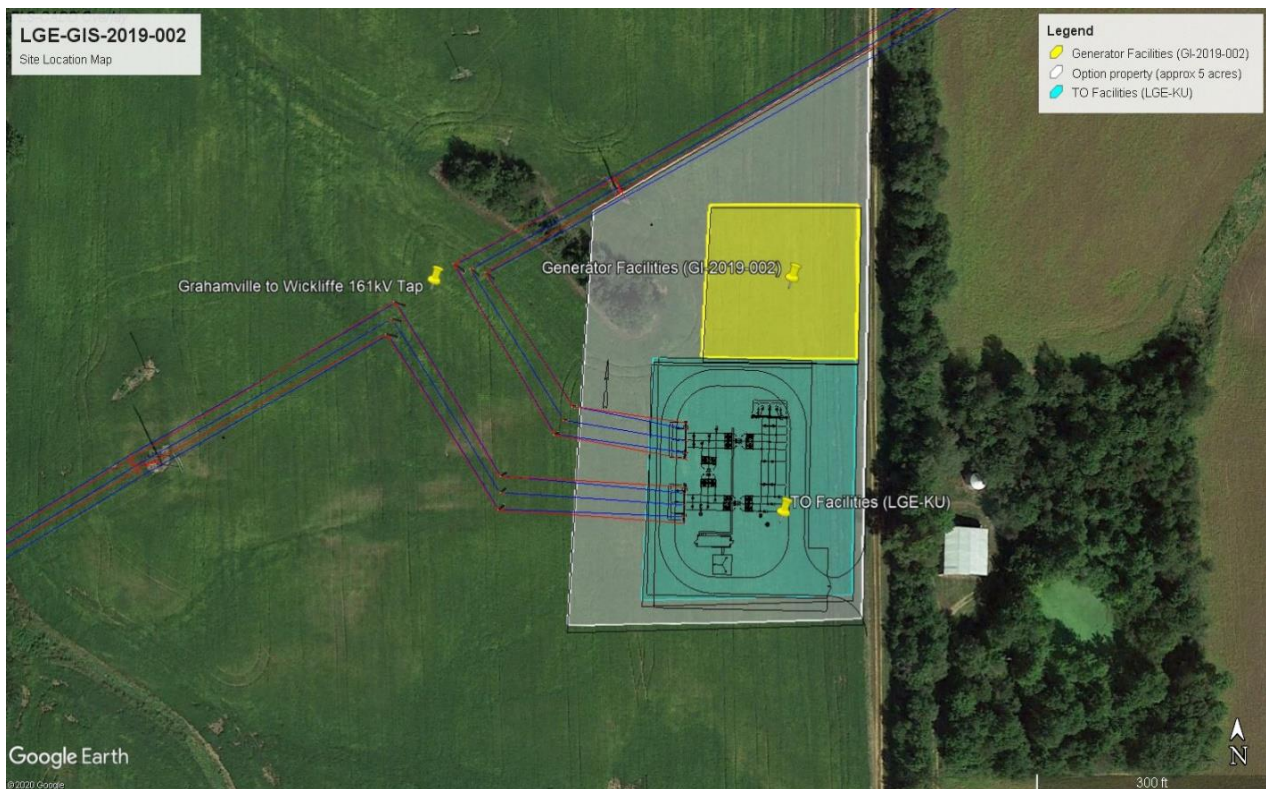
Details of the Transmission Interconnection Facilities and New Network Facilities required for the generation interconnection are provided in Section 4.5.

4.4 Description of Upgrades

This section describes facilities identified to be installed, replaced, and/or upgraded by LG&E-KU to accommodate the project. During detailed design other components may be identified for installation or replacement due to this interconnection.

The conceptual station arrangement developed for this estimate is included as Appendix A. The proposed station arrangement and location relative to the transmission corridor and the IC facilities is shown below in Figure 2. The approximate latitude and longitude of the POI is 37° 1'3.21"N, 88°54'50.30"W.

Figure 2. Project Location Map



The locations of the interconnection facilities were selected based on the following criteria:

- The anticipated size of the new 161kV station

- The proximity and orientation of the station to the existing 161kV transmission corridor, and
- The approximate interconnect facility boundary provided by the IC (See Appendix B)

4.5 Total Conceptual Cost Estimate: (Total Estimated Cost \$10,795,163 USD)

The cost estimates are based on a ring bus interconnection configuration as shown in Figure 1 in section 4.3 and the assumptions provided in the section 4.2. The estimated total project cost is estimated with +/- 20% accuracy.

4.5.1 Generator Owner Facilities

The generator owner is responsible for the installation and costs for the generator, step up transformer and customer protective devices up to the Transmission Owner (TO) metering equipment. The customer is responsible for determining the generator owner costs for the facilities owned and operated by the customer.

4.5.2 Transmission Interconnection Facilities: (Total Estimated Cost \$993,846)

The transmission interconnection facilities will include all equipment and materials at the interconnection facility between the Point of Ownership Change and the Point of Interconnection. The required equipment and materials are identified below, and a summary of the interconnection facilities costs are provided in Table 4-1.

4.5.2.1 Station

The transmission interconnection facilities will include the following:

4.5.2.1.1 High Voltage

- One (1) 161kV Motor-Operated Disconnect Switch
- Three (3) 161kV Surge Arresters
- Three (3) 161kV Metering CCVTs
- Three (3) 161kV Metering CTs

4.5.2.1.2 Civil/Structural

- One (1) Steel A-Frame structure
- Six (6) 1-Phase CCVT Supports

4.5.2.1.3 Protection & Control

- One (1) New Control House Space Allocation consisting of below relay panels:
- (1) line protection panel for GI Interconnect
 - (1) metering panel for GI
- (1) RTU panel
- AC/DC systems

4.5.3 Transmission Lines

Not applicable.

4.5.3.1 Telecommunication Facilities

- Not applicable.

Table 4-1
Transmission Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$287,730
Contract Labor	\$47,760
Contracted Materials	\$568,006
Company Materials	\$0
Contingency	\$90,350
Total	\$993,846

4.5.4 Network Facilities: (Total Estimated Cost \$9,801,317 USD)

4.5.4.1 Network Interconnection Facilities: (Total Estimated Cost \$9,801,317)

LG&E/KU and the vendor combined cost estimate for network interconnection facilities is shown in Table 4-2 and includes the following:

4.5.4.1.1 Station

- The new network interconnection facility will be a three (3) breaker ring bus arrangement with three (3) 161kV lines (Grahamville, Wickliffe, & GI Interconnect) and the following equipment:

4.5.4.1.2 High Voltage

- Three (3) 161kV Circuit Breakers
- Six (6) 161kV Manually Operated Disconnect Switches
- Six (6) 161kV Surge Arresters
- Six (6) 161kV CCVTs
- Two (2) 161kV SSVTs

4.5.4.1.3 Civil/Structural

- Two (2) Steel H-Frame structures
- Five (5) 3-Phase High Bus Supports
- Twelve (12) 1-Phase Low Bus Supports
- Six (6) Switch Support Stands
- Six (6) 1-Phase CCVT Supports
- Two (2) SSVT Supports
- One (1) Lightning Mast

4.5.4.1.4 Protection & Control

- One (1) Small (14' x 42') control house consisting of the following relay panels:
 - (2) line protection panels for Grahamville & Wickliffe & GI Interconnect
 - (2) Digital communications paths, (1) associated with the Grahamville line and (1) associated with the Wickliffe line
 - (1) RTU panel
 - (1) DFR panel
 - AC/DC systems
- One (1) line protection replacement panel at Wickliffe

4.5.4.2 Transmission Lines

- Four (4) 161kV three (3) pole steel dead end structures and foundations
- Hardware and Conductor for taps from existing 161kV line to the station structure

4.5.4.3 Telecommunication Facilities

- One (1) 195' tall Microwave tower and foundations
- Antennae systems
- MW Radio HS Terminal
- Digital Multiplex Systems and Channels
- DC Power

Table 4-2
Network Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$3,995,967
Contract Labor	\$937,195
Contracted Materials	\$3,195,551
Company Materials	\$781,575
Contingency	\$891,029
Total	\$9,801,317

4.5.5 Distribution Facilities: (Total Estimated Cost \$0 USD)

No distribution facility upgrades have been identified.

5. Conclusion and Project Completion Timeframes

The planned in-service date requested by the Interconnection Customer is June 1, 2023. The Conceptual Milestone Schedule (Table 5-1) to meet the requested in-service date.

Table 5-1 Conceptual Milestone Schedule

Milestone Activity	Milestone Dates
Project Initiation	June 2021
NTP for Engineering, Procurement and Construction	1-Mar-22
Engineering	1-Mar-22 to 1-Sep-22
Procurement	1-May-22 to 1-Nov-22
Construction Mobilization	1-Sep-22
Testing & Commissioning	1-Jun-23
In-Service Date	1-Jun-23

The overall estimated timeline for this project is approximately 24 months from the date of the interconnect agreement. This includes approximately six (6) to nine (9) months for project initiation and 15 to 18 months for the engineering, procurement, and construction phases. This estimate includes the assumption that the project schedule would not be impacted by storm damage and restoration, time of year limitations, permitting issues, outage scheduling, system emergencies, and contractor and equipment availability, or other unforeseen circumstances.

Customer must work with the TO to provide relay settings as identified in the section 2.6.1 (see Table 2-2-A and 2-2-B in this report). Interconnection to LG&E and KU system is contingent on steady state, short circuit and dynamic model, assumptions and settings used in the SIS and facilities study.

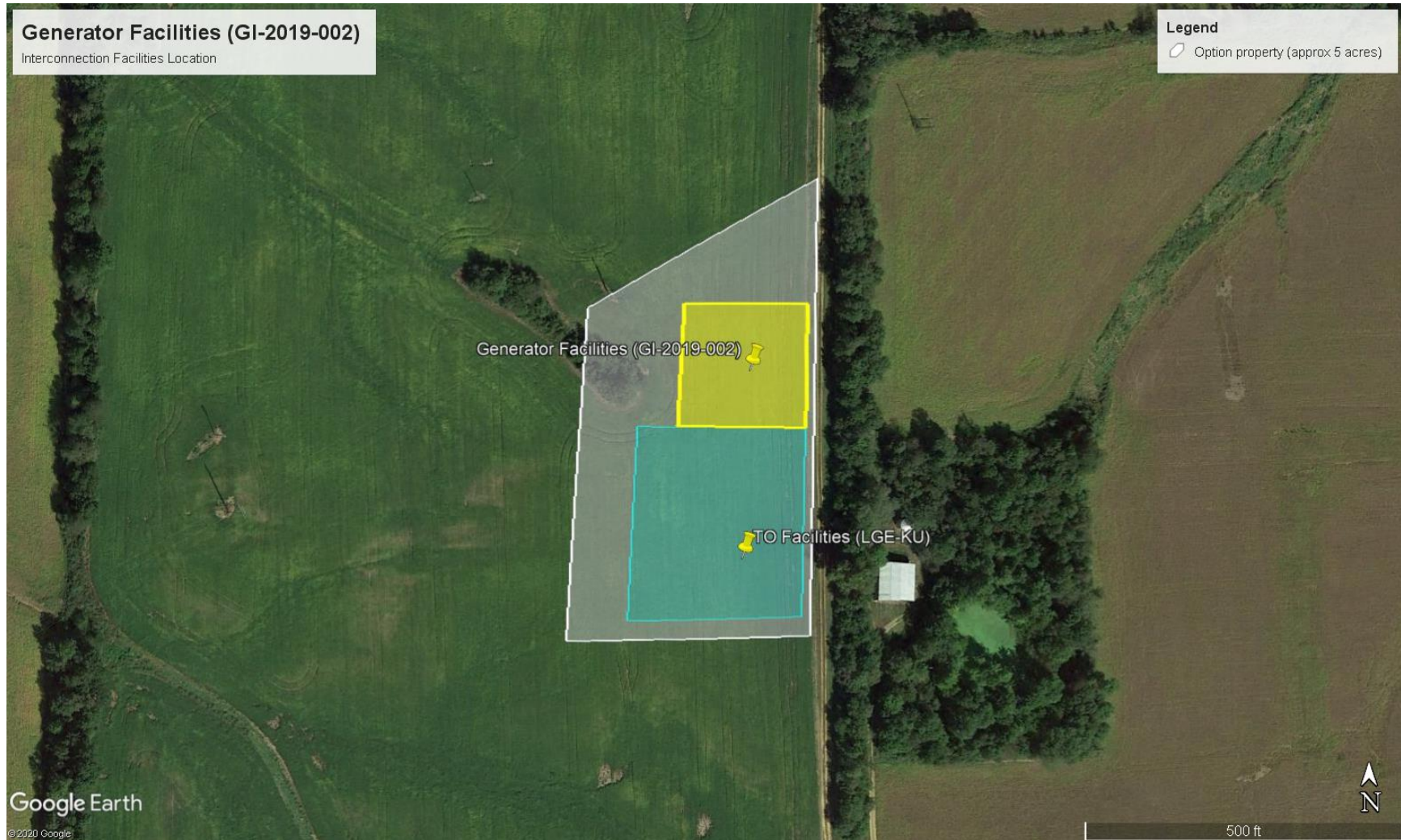
6. References

[1]https://www.oasis.oati.com/woa/docs/LGEE/LGEEdocs/Allocation_of_Costs_for_Generator_Interconnections_effective_1-1-2018.pdf

Appendix A. Conceptual Substation Layout

The appendix A of this report is available on the LG&E and KU Critical Energy Infrastructure Information (CEII) File Transfer Protocol (FTP) site. The LG&E and KU secure CEII FTP site URL is: <https://eftws.lge-ku.com/EFTClient/Account/Login.htm>.

Appendix B. Approximate Property Boundaries



LARGE GENERATOR INTERCONNECTION AGREEMENT (LGIA)

Entered into by

Louisville Gas and Electric Company

And Kentucky Utilities Company

And

Song Sparrow Solar, LLC

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STANDARD LARGE GENERATOR
INTERCONNECTION AGREEMENT (LGIA)**

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STANDARD LARGE GENERATOR INTERCONNECTION AGREEMENT

THIS STANDARD LARGE GENERATOR INTERCONNECTION AGREEMENT ("Agreement") is made and entered into this ____ day of _____ 20__, by and between Song Sparrow Solar, LLC _____, a _____ organized and existing under the laws of the State/Commonwealth of _____ ("Interconnection Customer" with a Large Generating Facility), and Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company ("KU"), each a corporation organized and existing under the laws of the State/Commonwealth of Kentucky ("Transmission

Owner”). Interconnection Customer and Transmission Owner each may be referred to as a "Party" or collectively as the "Parties."

Recitals

WHEREAS, Interconnection Customer intends to own, lease and/or control and operate the Generating Facility identified as a Large Generating Facility in Appendix C to this Agreement; and,

WHEREAS, Interconnection Customer and Transmission Owner have agreed to enter into this Agreement for the purpose of interconnecting the Large Generating Facility with the Transmission Owner’s Transmission System;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein, it is agreed:

When used in this Standard Large Generator Interconnection Agreement, terms with initial capitalization that are not defined in Article 1 shall have the meanings specified in the Article in which they are used or in the Open Access Transmission Tariff (OATT).

Article 1. Definitions

Adverse System Impact shall mean the negative effects due to technical or operational limits on conductors or equipment being exceeded that may compromise the safety and reliability of the electric system.

Affected System shall mean an electric system other than the Transmission Owner’s Transmission System that may be affected by the proposed interconnection.

Affected System Operator shall mean the entity that operates an Affected System.

Affiliate shall mean, with respect to a corporation, partnership or other entity, each such other corporation, partnership or other entity that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such corporation, partnership or other entity.

Ancillary Services shall mean those services that are necessary to support the transmission of capacity and energy from resources to loads while maintaining reliable operation of the Transmission Owner’s Transmission System in accordance with Good Utility Practice.

Applicable Laws and Regulations shall mean all duly promulgated applicable federal, state and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any Governmental Authority.

Applicable Reliability Council shall mean the reliability council applicable to the Transmission System to which the Generating Facility is directly interconnected.

Applicable Reliability Standards shall mean the requirements and guidelines of NERC, the Applicable Reliability Council, and the Balancing Authority Area of the Transmission System to which the Generating Facility is directly interconnected.

Balancing Authority Area shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other

Balancing Authority Areas and contributing to frequency regulation of the interconnection. A Balancing Authority Area must be certified by the Applicable Reliability Council.

Base Case shall mean the base case power flow, short circuit, and stability data bases used for the Interconnection Studies by the ITO, Transmission Owner or Interconnection Customer.

Breach shall mean the failure of a Party to perform or observe any material term or condition of the Standard Large Generator Interconnection Agreement.

Breaching Party shall mean a Party that is in Breach of the Standard Large Generator Interconnection Agreement.

Business Day shall mean Monday through Friday, excluding Federal Holidays.

Calendar Day shall mean any day including Saturday, Sunday or a Federal Holiday.

Clustering shall mean the process whereby a group of Generator Interconnection Requests is studied together, instead of serially, for the purpose of conducting the Interconnection System Impact Study.

Commercial Operation shall mean the status of a Generating Facility that has commenced generating electricity for sale, excluding electricity generated during Trial Operation.

Commercial Operation Date of a unit shall mean the date on which the Generating Facility commences Commercial Operation as agreed to by the Parties pursuant to Appendix E to the Standard Large Generator Interconnection Agreement.

Confidential Information shall mean any confidential, proprietary or trade secret information of a plan, specification, pattern, procedure, design, device, list, concept, policy or compilation relating to the present or planned business of a Party, which is designated as confidential by the Party supplying the information, whether conveyed orally, electronically, in writing, through inspection, or otherwise.

Default shall mean the failure of a Breaching Party to cure its Breach in accordance with Article 17 of the Standard Large Generator Interconnection Agreement.

Dispute Resolution shall mean the procedure for resolution of a dispute between the Parties in which they will first attempt to resolve the dispute on an informal basis.

Distribution System shall mean the Transmission Owner's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances. The voltage levels at which distribution systems operate differ among areas.

Distribution Upgrades shall mean the additions, modifications, and upgrades to the Transmission Owner's Distribution System at or beyond the Point of Interconnection to facilitate interconnection of the Generating Facility and render the transmission service necessary to effect Interconnection Customer's wholesale sale of electricity in interstate commerce. Distribution Upgrades do not include Interconnection Facilities.

Effective Date shall mean the date on which the Standard Large Generator Interconnection Agreement becomes effective upon execution by the Parties subject to acceptance by FERC, or if filed unexecuted, upon

the date specified by FERC.

Emergency Condition shall mean a condition or situation: (1) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (2) that, in the case of the Transmission Owner, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to Transmission Owner's Transmission System, Transmission Owner's Interconnection Facilities or the electric systems of others to which the Transmission Owner's Transmission System is directly connected; or (3) that, in the case of Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Generating Facility or Interconnection Customer's Interconnection Facilities. System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by the Standard Large Generator Interconnection Agreement to possess black start capability.

Energy Resource Interconnection Service shall mean an Interconnection Service that allows the Interconnection Customer to connect its Generating Facility to the Transmission Owner's Transmission System to be eligible to deliver the Generating Facility's electric output using the existing firm or nonfirm capacity of the Transmission Owner's Transmission System on an as available basis. Energy Resource Interconnection Service in and of itself does not convey transmission service.

Engineering & Procurement (E&P) Agreement shall mean an agreement that authorizes the Transmission Owner to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection in order to advance the implementation of the Generator Interconnection Request.

Environmental Law shall mean Applicable Laws or Regulations relating to pollution or protection of the environment or natural resources.

Federal Power Act shall mean the Federal Power Act, as amended, 16 U.S.C. §§ 791a et seq.

FERC shall mean the Federal Energy Regulatory Commission (Commission) or its successor.

Force Majeure shall mean any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A Force Majeure event does not include acts of negligence or intentional wrongdoing by the Party claiming Force Majeure.

Generating Facility shall mean Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Generator Interconnection Request, but shall not include the Interconnection Customer's Interconnection Facilities.

Generating Facility Capacity shall mean the net capacity of the Generating Facility and the aggregate net capacity of the Generating Facility where it includes multiple energy production devices.

Generator Interconnection Request shall mean an Interconnection Customer's request, in the form of Appendix 1 to the Standard Large Generator Interconnection Procedures, in accordance with the Tariff, to interconnect a new Generating Facility, or to increase the capacity of, or make a Material Modification to the operating characteristics of, an existing Generating Facility that is interconnected with the Transmission Owner's Transmission System.

Good Utility Practice shall mean any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority shall mean any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include Interconnection Customer, ITO, Transmission Owner, or any Affiliate thereof.

Hazardous Substances shall mean any chemicals, materials or substances defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "hazardous constituents," "restricted hazardous materials," "extremely hazardous substances," "toxic substances," "radioactive substances," "contaminants," "pollutants," "toxic pollutants" or words of similar meaning and regulatory effect under any applicable Environmental Law, or any other chemical, material or substance, exposure to which is prohibited, limited or regulated by any applicable Environmental Law.

Independent Transmission Organization shall mean the entity (referred to herein as the "ITO") to which LG&E/KU have delegated the responsibility and authority to administer the Tariff.

Initial Synchronization Date shall mean the date upon which the Generating Facility is initially synchronized and upon which Trial Operation begins.

In-Service Date shall mean the date upon which the Interconnection Customer reasonably expects it will be ready to begin use of the Transmission Owner's Interconnection Facilities to obtain back feed power.

Interconnection Customer shall mean any entity, including the Transmission Owner or any of the Affiliates or subsidiaries of the Transmission Owner, that proposes to interconnect its Generating Facility with the Transmission Owner's Transmission System.

Interconnection Customer's Interconnection Facilities shall mean all facilities and equipment, as identified in Appendix A of the Standard Large Generator Interconnection Agreement, that are located between the Generating Facility and the Point of Change of Ownership, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the Transmission Owner's Transmission System. Interconnection Customer's Interconnection Facilities are sole use facilities.

Interconnection Facilities shall mean the Transmission Owner's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to the Transmission Owner's Transmission System. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Interconnection Facilities Study shall mean a study conducted for the Interconnection Customer by the Transmission Owner as directed, and subject to review by, the ITO, in order to determine a list of facilities (including Transmission Owner's Interconnection Facilities and Network Upgrades as identified in the Interconnection System Impact Study), the cost of those facilities, and the time required to interconnect the Generating Facility with the Transmission Owner's Transmission System. The scope of the study is defined in Section 8 of the Standard Large Generator Interconnection Procedures.

Interconnection Facilities Study Agreement shall mean the form of agreement contained in Appendix 4 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection Facilities Study.

Interconnection Feasibility Study shall mean a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to the Transmission Owner's Transmission System, the scope of which is described in Section 6 of the Standard Large Generator Interconnection Procedures.

Interconnection Feasibility Study Agreement shall mean the form of agreement contained in Appendix 2 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection Feasibility Study.

Interconnection Service shall mean the service provided by the Transmission Owner associated with interconnecting the Interconnection Customer's Generating Facility to the Transmission Owner's Transmission System and enabling it to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Standard Large Generator Interconnection Agreement and, if applicable, the Transmission Owner's Tariff.

Interconnection Study shall mean any of the following studies: the Interconnection Feasibility Study, the Interconnection System Impact Study, and the Interconnection Facilities Study described in the Standard Large Generator Interconnection Procedures.

Interconnection System Impact Study shall mean an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of Transmission Owner's Transmission System and, if applicable, an Affected System. The study shall identify and detail the system impacts that would result if the Generating Facility were interconnected without project modifications or system modifications, focusing on the Adverse System Impacts identified in the Interconnection Feasibility Study, or to study potential impacts, including but not limited to those identified in the Scoping Meeting as described in the Standard Large Generator Interconnection Procedures.

Interconnection System Impact Study Agreement shall mean the form of agreement contained in Appendix 3 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection System Impact Study.

IRS shall mean the Internal Revenue Service.

Joint Operating Committee shall be a group made up of representatives from Interconnection Customers and the Transmission Owner to coordinate operating and technical considerations of Interconnection Service.

Large Generating Facility shall mean a Generating Facility having a Generating Facility Capacity of more than 20 MW.

Loss shall mean any and all losses relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's performance, or non-performance of its obligations under the Standard Large Generator Interconnection Agreement on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnifying Party.

Material Modification shall mean those modifications that have a material impact on the cost or timing of any Generator Interconnection Request with a later queue priority date.

Metering Equipment shall mean all metering equipment installed or to be installed at the Generating Facility pursuant to the Standard Large Generator Interconnection Agreement at the metering points, including but not limited to instrument transformers, MWh-meters, data acquisition equipment, transducers, remote terminal unit, communications equipment, phone lines, and fiber optics.

NERC shall mean the North American Electric Reliability Council or its successor organization.

Network Resource shall mean any designated generating resource owned, purchased, or leased by a Network Customer under the Network Integration Transmission Service Tariff. Network Resources do not include any resource, or any portion thereof, that is committed for sale to third parties or otherwise cannot be called upon to meet the Network Customer's Network Load on a non-interruptible basis.

Network Resource Interconnection Service shall mean an Interconnection Service that allows the Interconnection Customer to integrate its Large Generating Facility with the Transmission Owner's Transmission System (1) in a manner comparable to that in which the Transmission Owner integrates its generating facilities to serve native load customers; or (2) in an RTO or ISO with market based congestion management, in the same manner as Network Resources. Network Resource Interconnection Service in and of itself does not convey transmission service.

Network Upgrades shall mean the additions, modifications, and upgrades to the Transmission Owner's Transmission System required at or beyond the point at which the Interconnection Facilities connect to the Transmission Owner's Transmission System to accommodate the interconnection of the Large Generating Facility to the Transmission Owner's Transmission System.

Notice of Dispute shall mean a written notice of a dispute or claim that arises out of or in connection with the Standard Large Generator Interconnection Agreement or its performance.

Optional Interconnection Study shall mean a sensitivity analysis based on assumptions specified by the Interconnection Customer in the Optional Interconnection Study Agreement.

Optional Interconnection Study Agreement shall mean the form of agreement contained in Appendix 5 of the Standard Large Generator Interconnection Procedures for conducting the Optional Interconnection Study.

Party or Parties shall mean the Transmission Owner, Interconnection Customer or any combination of the above.

Point of Change of Ownership shall mean the point, as set forth in Appendix A to the Standard Large Generator Interconnection Agreement, where the Interconnection Customer's Interconnection Facilities connect to the Transmission Owner's Interconnection Facilities.

Point of Interconnection shall mean the point, as set forth in Appendix A to the Standard Large Generator Interconnection Agreement, where the Interconnection Facilities connect to the Transmission Owner's Transmission System.

Provisional Interconnection Service shall mean Interconnection Service approved by the ITO and provided by Transmission Owner associated with interconnecting the Interconnection Customer's Generating Facility to Transmission Owner's Transmission System and enabling that Transmission System to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Provisional Large Generator Interconnection Agreement and, if applicable, the Tariff.

Provisional Large Generator Interconnection Agreement shall mean the interconnection agreement for Provisional Interconnection Service established between the Transmission Owner and the Interconnection Customer. This agreement shall take the form of the Large Generator Interconnection Agreement, modified for provisional purposes.

Queue Position shall mean the order of a valid Generator Interconnection Request, relative to all other pending valid Generator Interconnection Requests, that is established based upon the date and time of receipt of the valid Generator Interconnection Request by the ITO.

Reasonable Efforts shall mean, with respect to an action required to be attempted or taken by a Party under the Standard Large Generator Interconnection Agreement, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

Reliability Coordinator shall mean the party charged with providing reliability coordination service for the Transmission Owner's system in accordance with Attachment P hereto.

Scoping Meeting shall mean the meeting between representatives of the Interconnection Customer, Transmission Owner, and ITO conducted for the purpose of discussing alternative interconnection options, to exchange information including any transmission data and earlier study evaluations that would be reasonably expected to impact such interconnection options, to analyze such information, and to determine the potential feasible Points of Interconnection.

Site Control shall mean documentation reasonably demonstrating: (1) ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing the Generating Facility; (2) an option to purchase or acquire a leasehold site for such purpose; or (3) an exclusivity or other business relationship between Interconnection Customer and the entity having the right to sell, lease or grant Interconnection Customer the right to possess or occupy a site for such purpose.

Small Generating Facility shall mean a Generating Facility that has a Generating Facility Capacity of no more than 20 MW.

Stand Alone Network Upgrades shall mean Network Upgrades that are not part of an Affected System that an Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction. Both the Transmission Owner and the Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement. If the Transmission Owner and Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, the Transmission Owner must provide the Interconnection Customer a written technical explanation outlining why

the Transmission Owner does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination.

Standard Large Generator Interconnection Agreement (LGIA) shall mean the form of interconnection agreement applicable to an Generator Interconnection Request pertaining to a Large Generating Facility that is included in the Transmission Owner's Tariff.

Standard Large Generator Interconnection Procedures (LGIP) shall mean the interconnection procedures applicable to an Generator Interconnection Request pertaining to a Large Generating Facility that are included in the Transmission Owner's Tariff.

Surplus Interconnection Service shall mean any unneeded portion of Interconnection Service established in a Large Generator Interconnection Agreement, such that if Surplus Interconnection Service is utilized the total amount of Interconnection Service at the Point of Interconnection would remain the same.

System Protection Facilities shall mean the equipment, including necessary protection signal communications equipment, required to protect (1) the Transmission Owner's Transmission System from faults or other electrical disturbances occurring at the Generating Facility and (2) the Generating Facility from faults or other electrical system disturbances occurring on the Transmission Owner's Transmission System or on other delivery systems or other generating systems to which the Transmission Owner's Transmission System is directly connected.

Tariff shall mean the Transmission Owner's Tariff through which open access transmission service and Interconnection Service are offered, as filed with FERC, and as amended or supplemented from time to time, or any successor tariff.

Transmission Owner shall mean LG&E/KU, the public utility operating companies.

Transmission Owner's Interconnection Facilities shall mean all facilities and equipment owned, controlled or operated by the Transmission Owner from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Transmission Owner's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Transmission System shall mean the facilities owned and operated by the Transmission Owner that are used to provide transmission service under Part II and Part III of the Transmission Owner's Tariff.

Trial Operation shall mean the period during which Interconnection Customer is engaged in on-site test operations and commissioning of the Generating Facility prior to Commercial Operation.

Variable Energy Resource shall mean a device for the production of electricity that is characterized by an energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator.

Article 2. Effective Date, Term, and Termination

2.1 Effective Date.

This LGIA shall become effective upon execution by the Parties subject to acceptance by FERC (if applicable), or if filed unexecuted, upon the date specified by FERC. The Transmission Owner shall promptly file this LGIA with FERC upon execution in accordance with Article 3.1, if required.

2.2 Term of Agreement.

Subject to the provisions of Article 2.3, this LGIA shall remain in effect for a period of ten (10) years from the Effective Date or such other longer period as Interconnection Customer may request (Term to be specified in individual agreements) and shall be automatically renewed for each successive one-year period thereafter.

2.3 Termination Procedures.

2.3.1 Written Notice.

This LGIA may be terminated by Interconnection Customer after giving Transmission Owner ninety (90) Calendar Days advance written notice, or by the Transmission Owner notifying FERC after the Generating Facility permanently ceases Commercial Operation.

2.3.2 Default.

Any Party may terminate this LGIA in accordance with Article 17.

2.3.3 Notwithstanding Articles 2.3.1 and 2.3.2, no termination shall become effective until the Parties have complied with all Applicable Laws and Regulations applicable to such termination, including the filing with FERC of a notice of termination of this LGIA, which notice has been accepted for filing by FERC.

2.4 Termination Costs.

If a Party elects to terminate this Agreement pursuant to Article 2.3 above, each Party shall pay all costs incurred (including any cancellation costs relating to orders or contracts for Interconnection Facilities and equipment) or charges assessed by the other Party, as of the date of the other Party's receipt of such notice of termination, that are the responsibility of the Terminating Party under this LGIA. In the event of termination by a Party, the other Party shall use commercially Reasonable Efforts to mitigate the costs, damages and charges arising as a consequence of termination. Upon termination of this LGIA, unless otherwise ordered or approved by FERC:

2.4.1 With respect to any portion of Transmission Owner's Interconnection Facilities that have not yet been constructed or installed, Transmission Owner shall to the extent possible and with Interconnection Customer's authorization cancel any pending orders of, or return, any materials or equipment for, or contracts for construction of, such facilities; provided that in the event Interconnection Customer elects not to authorize such cancellation, Interconnection Customer shall assume all payment obligations with respect to such materials, equipment, and contracts, and Transmission Owner shall deliver such material and equipment, and, if necessary, assign such contracts, to Interconnection Customer as soon as practicable, at Interconnection Customer's expense. To the extent that Interconnection Customer has already paid Transmission Owner for any or all such costs of materials or equipment not taken by Interconnection Customer, Transmission Owner shall promptly refund such amounts to Interconnection Customer, less any costs, including penalties incurred by Transmission Owner to cancel any pending orders of or return such materials, equipment, or contracts.

If an Interconnection Customer terminates this LGIA, it shall be responsible for all

costs incurred in association with that Interconnection Customer's interconnection, including any cancellation costs relating to orders or contracts for Interconnection Facilities and equipment, and other expenses including any Network Upgrades for which Transmission Owner has incurred expenses and has not been reimbursed by Interconnection Customer.

2.4.2 Transmission Owner may, at its option, retain any portion of such materials, equipment, or facilities that Interconnection Customer chooses not to accept delivery of, in which case Transmission Owner shall be responsible for all costs associated with procuring such materials, equipment, or facilities.

2.4.3 With respect to any portion of the Interconnection Facilities, and any other facilities already installed or constructed pursuant to the terms of this LGIA, Interconnection Customer shall be responsible for all costs associated with the removal, relocation or other disposition or retirement of such materials, equipment, or facilities.

2.5 Disconnection.

Upon termination of this LGIA, the Parties will take all appropriate steps to disconnect the Large Generating Facility from the Transmission System. All costs required to effectuate such disconnection shall be borne by the terminating Party, unless such termination resulted from a non-terminating Party's Default of this LGIA or such non-terminating Party otherwise is responsible for these costs under this LGIA.

2.6 Survival.

This LGIA shall continue in effect after termination to the extent necessary to provide for final billings and payments and for costs incurred hereunder, including billings and payments pursuant to this LGIA; to permit the determination and enforcement of liability and indemnification obligations arising from acts or events that occurred while this LGIA was in effect; and to permit each Party to have access to the lands of the other Party pursuant to this LGIA or other applicable agreements, to disconnect, remove or salvage its own facilities and equipment.

Article 3. Regulatory Filings

3.1 Filing.

The Transmission Owner shall file this LGIA (and any amendment hereto) with the appropriate Governmental Authority, if required. Interconnection Customer may request that any information so provided be subject to the confidentiality provisions of Article 22. If Interconnection Customer has executed this LGIA, or any amendment thereto, Interconnection Customer shall reasonably cooperate with Transmission Owner with respect to such filing and to provide any information reasonably requested by Transmission Owner needed to comply with applicable regulatory requirements.

Article 4. Scope of Service

4.1 Interconnection Product Options.

Interconnection Customer has selected the following (checked) type of Interconnection Service:

4.1.1 Energy Resource Interconnection Service.

4.1.1.1 The Product.

Energy Resource Interconnection Service allows Interconnection Customer to connect the Large Generating Facility to the Transmission

System and be eligible to deliver the Large Generating Facility's output using the existing firm or non-firm capacity of the Transmission System on an "as available" basis. To the extent Interconnection Customer wants to receive Energy Resource Interconnection Service, Transmission Owner shall construct facilities identified in Attachment A.

4.1.1.2 Transmission Delivery Service Implications.

Under Energy Resource Interconnection Service, Interconnection Customer will be eligible to inject power from the Large Generating Facility into and deliver power across the interconnecting Transmission Owner's Transmission System on an "as available" basis up to the amount of MWs identified in the applicable stability and steady state studies to the extent the upgrades initially required to qualify for Energy Resource Interconnection Service have been constructed. Where eligible to do so (e.g., PJM, ISO-NE, NYISO), Interconnection Customer may place a bid to sell into the market up to the maximum identified Large Generating Facility output, subject to any conditions specified in the interconnection service approval, and the Large Generating Facility will be dispatched to the extent Interconnection Customer's bid clears. In all other instances, no transmission delivery service from the Large Generating Facility is assured, but Interconnection Customer may obtain Point-to-Point Transmission Service, Network Integration Transmission Service, or be used for secondary network transmission service, pursuant to Transmission Owner's Tariff, up to the maximum output identified in the stability and steady state studies. In those instances, in order for Interconnection Customer to obtain the right to deliver or inject energy beyond the Large Generating Facility Point of Interconnection or to improve its ability to do so, transmission delivery service must be obtained pursuant to the provisions of Transmission Owner's Tariff. The Interconnection Customer's ability to inject its Large Generating Facility output beyond the Point of Interconnection, therefore, will depend on the existing capacity of Transmission Owner's Transmission System at such time as a transmission service request is made that would accommodate such delivery. The provision of firm Point-to-Point Transmission Service or Network Integration Transmission Service may require the construction of additional Network Upgrades.

4.1.2 Network Resource Interconnection Service.

4.1.2.1 The Product.

ITO must conduct the necessary studies in coordination with the Transmission Owner and the Transmission Owner must construct the Network Upgrades needed to integrate the Large Generating Facility (1) in a manner comparable to that in which Transmission Owner integrates its generating facilities to serve native load customers; or (2) in an ISO or RTO with market based congestion management, in the same manner as all Network Resources. To the extent Interconnection Customer wants to receive Network Resource Interconnection Service, Transmission Owner shall construct the facilities identified in Attachment A to this LGIA.

4.1.2.2 Transmission Delivery Service Implications.

Network Resource Interconnection Service allows Interconnection Customer's Large Generating Facility to be designated by any Network Customer under the Tariff on Transmission Owner's Transmission System as a Network Resource, up to the Large Generating Facility's full output, on the same basis as existing Network Resources interconnected to Transmission Owner's Transmission System, and to be studied as a Network Resource on the assumption that such a designation will occur. Although Network Resource Interconnection Service does not convey a reservation of transmission service, any Network Customer under the Tariff can utilize its network service under the Tariff to obtain delivery of energy from the interconnected Interconnection Customer's Large Generating Facility in the same manner as it accesses Network Resources. A Large Generating Facility receiving Network Resource Interconnection Service may also be used to provide Ancillary Services after technical studies and/or periodic analyses are performed with respect to the Large Generating Facility's ability to provide any applicable Ancillary Services, provided that such studies and analyses have been or would be required in connection with the provision of such Ancillary Services by any existing Network Resource. However, if an Interconnection Customer's Large Generating Facility has not been designated as a Network Resource by any load, it cannot be required to provide Ancillary Services except to the extent such requirements extend to all generating facilities that are similarly situated. The provision of Network Integration Transmission Service or firm Point-to-Point Transmission Service may require additional studies and the construction of additional upgrades. Because such studies and upgrades would be associated with a request for delivery service under the Tariff, cost responsibility for the studies and upgrades would be in accordance with FERC's policy for pricing transmission delivery services. Network Resource Interconnection Service does not necessarily provide Interconnection Customer with the capability to physically deliver the output of its Large Generating Facility to any particular load on Transmission Owner's Transmission System without incurring congestion costs. In the event of transmission constraints on Transmission Owner's Transmission System, Interconnection Customer's Large Generating Facility shall be subject to the applicable congestion management procedures in Transmission Owner's Transmission System in the same manner as Network Resources. There is no requirement either at the time of study or interconnection, or at any point in the future, that Interconnection Customer's Large Generating Facility be designated as a Network Resource by a Network Service Customer under the Tariff or that Interconnection Customer identify a specific buyer (or sink). To the extent a Network Customer does designate the Large Generating Facility as a Network Resource, it must do so pursuant to Transmission Owner's Tariff. Once an Interconnection Customer satisfies the requirements for obtaining Network Resource Interconnection Service, any future transmission service request for delivery from the Large Generating

Facility within Transmission Owner's Transmission System of any amount of capacity and/or energy, up to the amount initially studied, will not require that any additional studies be performed or that any further upgrades associated with such Large Generating Facility be undertaken, regardless of whether or not such Large Generating Facility is ever designated by a Network Customer as a Network Resource and regardless of changes in ownership of the Large Generating Facility. However, the reduction or elimination of congestion or redispatch costs may require additional studies and the construction of additional upgrades.

To the extent Interconnection Customer enters into an arrangement for long term transmission service for deliveries from the Large Generating Facility outside Transmission Owner's Transmission System, such request may require additional studies and upgrades in order for ITO to grant such request.

4.2 Provision of Service.

The Transmission Owner shall provide Interconnection Service for the Large Generating Facility at the Point of Interconnection.

4.3 Performance Standards.

Each Party shall perform all of its obligations under this LGIA in accordance with Applicable Laws and Regulations, Applicable Reliability Standards, and Good Utility Practice, and to the extent a Party is required or prevented or limited in taking any action by such regulations and standards, such Party shall not be deemed to be in Breach of this LGIA for its compliance therewith. If such Party is a Transmission Owner, then that Party shall amend the LGIA and submit the amendment to FERC for approval.

4.4 No Transmission Delivery Service.

The execution of this LGIA does not constitute a request for, nor the provision of, any transmission delivery service under Transmission Owner's Tariff, and does not convey any right to deliver electricity to any specific customer or Point of Delivery.

4.5 Interconnection Customer Provided Services.

The services provided by Interconnection Customer under this LGIA are set forth in Article 9.6 and Article 13.5.1. Interconnection Customer shall be paid for such services in accordance with Article 11.6.

Article 5. Interconnection Facilities Engineering, Procurement, and Construction

5.1 Options.

Unless otherwise mutually agreed to between the Parties, Interconnection Customer shall select the In-Service Date, Initial Synchronization Date, and Commercial Operation Date; and either the Standard Option or Alternate Option, and such dates and selected option shall be set forth in Appendix B, Milestones. At the same time, Interconnection Customer shall indicate whether it elects to exercise the Option to Build set forth in Article 5.1.3 below. If the dates designated by Interconnection Customer are not acceptable to Transmission Owner, Transmission Owner shall so notify Interconnection Customer within thirty (30) Calendar Days. Upon receipt of the notification that Interconnection Customer's designated dates are not acceptable to

Transmission Owner, the Interconnection Customer shall notify Transmission Owner within thirty (30) Calendar Days whether it elects to exercise the Option to Build if it has not already elected to exercise the Option to Build.

5.1.1 Standard Option.

Transmission Owner shall design, procure, and construct Transmission Owner's Interconnection Facilities and Network Upgrades, using Reasonable Efforts to complete Transmission Owner's Interconnection Facilities and Network Upgrades by the dates set forth in Appendix B, Milestones. Transmission Owner shall not be required to undertake any action which is inconsistent with its standard safety practices, its material and equipment specifications, its design criteria and construction procedures, its labor agreements, and Applicable Laws and Regulations. In the event Transmission Owner reasonably expects that it will not be able to complete Transmission Owner's Interconnection Facilities and Network Upgrades by the specified dates, Transmission Owner shall promptly provide written notice to Interconnection Customer and shall undertake Reasonable Efforts to meet the earliest dates thereafter.

5.1.2 Alternate Option.

If the dates designated by Interconnection Customer are acceptable to the Transmission Owner, the Transmission Owner shall so notify Interconnection Customer within thirty (30) Calendar Days, and Transmission Owner shall assume responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities by the designated dates.

If Transmission Owner subsequently fails to complete Transmission Owner's Interconnection Facilities by the In-Service Date, to the extent necessary to provide back feed power; or fails to complete Network Upgrades by the Initial Synchronization Date to the extent necessary to allow for Trial Operation at full power output, unless other arrangements are made by the Parties for such Trial Operation; or fails to complete the Network Upgrades by the Commercial Operation Date, as such dates are reflected in Appendix B, Milestones; Transmission Owner shall pay Interconnection Customer liquidated damages in accordance with Article 5.3, Liquidated Damages, provided, however, the dates designated by Interconnection Customer shall be extended day for day for each day that any third party transmission provider refuses to grant clearances to install equipment.

5.1.3 Option to Build.

Interconnection Customer shall have the option to assume responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades on the dates specified in Article 5.1.2. Transmission Owner and Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify such Stand Alone Network Upgrades in Appendix A. Except for Stand Alone Network Upgrades, Interconnection Customer shall have no right to construct Network Upgrades under this option.

5.1.4 Negotiated Option.

If the dates designated by Interconnection Customer are not acceptable to Transmission Owner, the Parties shall in good faith attempt to negotiate terms and conditions (including revision of the specified dates and liquidated damages, the provision of incentives, or the procurement and construction of all facilities other

than Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build under Article 5.1.3). If the Parties are unable to reach agreement on such terms and conditions, then, pursuant to Article 5.1.1 (Standard Option), Transmission Owner shall assume responsibility for the design, procurement and construction of all facilities other than Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build.

5.2 General Conditions Applicable to Option to Build.

If Interconnection Customer assumes responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades,

- (1) Interconnection Customer shall engineer, procure equipment, and construct Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades (or portions thereof) using Good Utility Practice and using standards and specifications provided in advance by the Transmission Owner;
- (2) Interconnection Customer's engineering, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades shall comply with all requirements of law to which Transmission Owner would be subject in the engineering, procurement or construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;
- (3) Transmission Owner shall review and approve the engineering design, equipment acceptance tests, and the construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;
- (4) prior to commencement of construction, Interconnection Customer shall provide to Transmission Owner with a schedule for construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades, and shall promptly respond to requests for information from Transmission Owner;
- (5) at any time during construction, Transmission Owner shall have the right to gain unrestricted access to Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades and to conduct inspections of the same;
- (6) at any time during construction, should any phase of the engineering, equipment procurement, or construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades not meet the standards and specifications provided by Transmission Owner, Interconnection Customer shall be obligated to remedy deficiencies in that portion of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;
- (7) Interconnection Customer shall indemnify Transmission Owner for claims arising from Interconnection Customer's construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades under the terms and procedures applicable to Article 18.1 Indemnity;
- (8) Interconnection Customer shall transfer control of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades to Transmission Owner;
- (9) Unless Parties otherwise agree, Interconnection Customer shall transfer ownership of Transmission Owner's Interconnection Facilities and Stand-Alone Network Upgrades to Transmission Owner;
- (10) Transmission Owner shall approve and accept for operation and maintenance Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades to the extent

engineered, procured, and constructed in accordance with this Article 5.2; and (11) Interconnection Customer shall deliver to Transmission Owner "as-built" drawings, information, and any other documents that are reasonably required by Transmission Owner to assure that the Interconnection Facilities and Stand-Alone Network Upgrades are built to the standards and specifications required by Transmission Owner.

(12) If Interconnection Customer exercises the Option to Build pursuant to Article 5.1.3, Interconnection Customer shall pay Transmission Owner the agreed upon amount of [\$ PLACEHOLDER] for Transmission Owner to execute the responsibilities enumerated to Transmission Owner under Article 5.2. Transmission Owner shall invoice Interconnection Customer for this total amount to be divided on a monthly basis pursuant to Article 12.

5.3 Liquidated Damages.

The actual damages to Interconnection Customer, in the event Transmission Owner's Interconnection Facilities or Network Upgrades are not completed by the dates designated by Interconnection Customer and accepted by Transmission Owner pursuant to subparagraphs 5.1.2 or 5.1.4, above, may include Interconnection Customer's fixed operation and maintenance costs and lost opportunity costs. Such actual damages are uncertain and impossible to determine at this time. Because of such uncertainty, any liquidated damages paid by Transmission Owner to Interconnection Customer in the event that Transmission Owner does not complete any portion of Transmission Owner's Interconnection Facilities or Network Upgrades by the applicable dates, shall be an amount equal to ½ of 1 percent per day of the actual cost of Transmission Owner's Interconnection Facilities and Network Upgrades, in the aggregate, for which Transmission Owner has assumed responsibility to design, procure and construct.

However, in no event shall the total liquidated damages exceed 20 percent of the actual cost of Transmission Owner's Interconnection Facilities and Network Upgrades for which Transmission Owner has assumed responsibility to design, procure, and construct. The foregoing payments will be made by Transmission Owner to Interconnection Customer as just compensation for the damages caused to Interconnection Customer, which actual damages are uncertain and impossible to determine at this time, and as reasonable liquidated damages, but not as a penalty or a method to secure performance of this LGIA. Liquidated damages, when the Parties agree to them, are the exclusive remedy for the Transmission Owner's failure to meet its schedule.

No liquidated damages shall be paid to Interconnection Customer if: (1) Interconnection Customer is not ready to commence use of Transmission Owner's Interconnection Facilities or Network Upgrades to take the delivery of power for the Large Generating Facility's Trial Operation or to export power from the Large Generating Facility on the specified dates, unless Interconnection Customer would have been able to commence use of Transmission Owner's Interconnection Facilities or Network Upgrades to take the delivery of power for Large Generating Facility's Trial Operation or to export power from the Large Generating Facility, but for Transmission Owner's delay; (2) Transmission Owner's failure to meet the specified dates is the result of the action or inaction of Interconnection Customer or any other Interconnection Customer who has entered into an LGIA with Transmission Owner or any cause beyond Transmission Owner's reasonable control or reasonable ability to cure; (3) the Interconnection Customer has assumed responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades; or (4) the Parties have otherwise agreed.

5.4 Power System Stabilizers.

The Interconnection Customer shall procure, install, maintain and operate Power System Stabilizers in accordance with the guidelines and procedures established by the Applicable Reliability Council. Transmission Owner reserves the right to reasonably establish minimum acceptable settings for any installed Power System Stabilizers, subject to the design and operating limitations of the Large Generating Facility. If the Large Generating Facility's Power System Stabilizers are removed from service or not capable of automatic operation, Interconnection Customer shall immediately notify the Transmission Owner. The requirements of this paragraph shall not apply to wind generators.

5.5 Equipment Procurement.

If responsibility for construction of Transmission Owner's Interconnection Facilities or Network Upgrades is to be borne by Transmission Owner, then Transmission Owner shall commence design of Transmission Owner's Interconnection Facilities or Network Upgrades and procure necessary equipment as soon as practicable after all of the following conditions are satisfied, unless the Parties otherwise agree in writing:

- 5.5.1** Transmission Owner has completed the Facilities Study pursuant to the Facilities Study Agreement;
- 5.5.2** Transmission Owner has received written authorization to proceed with design and procurement from Interconnection Customer by the date specified in Appendix B, Milestones; and
- 5.5.3** Interconnection Customer has provided security to Transmission Owner in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.6 Construction Commencement.

Transmission Owner shall commence construction of Transmission Owner's Interconnection Facilities and Network Upgrades for which it is responsible as soon as practicable after the following additional conditions are satisfied:

- 5.6.1** Approval of the appropriate Governmental Authority has been obtained for any facilities requiring regulatory approval;
- 5.6.2** Necessary real property rights and rights-of-way have been obtained, to the extent required for the construction of a discrete aspect of Transmission Owner's Interconnection Facilities and Network Upgrades;
- 5.6.3** The Transmission Owner has received written authorization to proceed with construction from Interconnection Customer by the date specified in Appendix B, Milestones; and
- 5.6.4** Interconnection Customer has provided security to Transmission Owner in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.7 Work Progress.

The Parties will keep each other advised periodically as to the progress of their respective design, procurement and construction efforts. Either Party may, at any time, request a progress report from the other Party. If, at any time, Interconnection Customer determines that the completion of Transmission Owner's Interconnection Facilities will not be required until after the specified In-Service Date, Interconnection Customer will provide written notice to Transmission Owner of such later date upon which the completion of Transmission Owner's Interconnection Facilities will be required.

5.8 Information Exchange.

As soon as reasonably practicable after the Effective Date, the Parties shall exchange information regarding the design and compatibility of the Parties' Interconnection Facilities and

compatibility of the Interconnection Facilities with Transmission Owner's Transmission System, and shall work diligently and in good faith to make any necessary design changes.

5.9 Other Interconnection Options.

If any of Transmission Owner's Interconnection Facilities or Network Upgrades are not reasonably expected to be completed prior to the Commercial Operation Date of the Large Generating Facility, Transmission Owner shall, upon the request and at the expense of Interconnection Customer, perform operating studies on a timely basis to determine the extent to which the Large Generating Facility and Interconnection Customer's Interconnection Facilities may operate prior to the completion of Transmission Owner's Interconnection Facilities or Network Upgrades consistent with Applicable Laws and Regulations, Applicable Reliability Standards, Good Utility Practice, and this LGIA. Transmission Owner shall permit Interconnection Customer to operate the Large Generating Facility and Interconnection Customer's Interconnection Facilities in accordance with the results of such studies.

5.9.1 Limited Operation.

5.9.2 Provisional Interconnection Service. Upon the request of Interconnection Customer, and prior to completion of requisite Interconnection Facilities, Network Upgrades, Distribution Upgrades, or System Protection Facilities Transmission Owner may execute a Provisional Large Generator Interconnection Agreement or Interconnection Customer may request the filing of an unexecuted Provisional Large Generator Interconnection Agreement with the Interconnection Customer for limited Interconnection Service at the discretion of Transmission Owner based upon an evaluation that will consider the results of available studies. The ITO shall determine, through available studies or additional studies as necessary, whether stability, short circuit, thermal, and/or voltage issues would arise if Interconnection Customer interconnects without modifications to the Generating Facility or Transmission System. The ITO, in consultation with the Transmission Owner, shall determine whether any Interconnection Facilities, Network Upgrades, Distribution Upgrades, or System Protection Facilities that are necessary to meet the requirements of NERC, or any applicable Regional Entity for the interconnection of a new, modified and/or expanded Generating Facility are in place prior to the commencement of Interconnection Service from the Generating Facility. Where available studies indicate that such, Interconnection Facilities, Network Upgrades, Distribution Upgrades, and/or System Protection Facilities that are required for the interconnection of a new, modified and/or expanded Generating Facility are not currently in place, the ITO will perform a study, at the Interconnection Customer's expense, to confirm the facilities that are required for Provisional Interconnection Service. The maximum permissible output of the Generating Facility in the Provisional Large Generator Interconnection Agreement shall be studied and updated annually and at the Interconnection Customer's expense. Interconnection Customer assumes all risk and liabilities with respect to changes between the Provisional Large Generator Interconnection Agreement and the Large Generator Interconnection Agreement, including changes in output limits and Interconnection Facilities, Network Upgrades, Distribution Upgrades, and/or System Protection Facilities cost responsibilities.

5.10 Interconnection Customer's Interconnection Facilities ('ICIF').

Interconnection Customer shall, at its expense, design, procure, construct, own and install the ICIF, as set forth in Appendix A, Interconnection Facilities, Network Upgrades and

Distribution Upgrades.

5.10.1 Interconnection Customer's Interconnection Facility Specifications.

Interconnection Customer shall submit initial specifications for the ICIF, including System Protection Facilities, to Transmission Owner at least one hundred eighty (180) Calendar Days prior to the Initial Synchronization Date; and final specifications for review and comment at least ninety (90) Calendar Days prior to the Initial Synchronization Date. Transmission Owner shall review such specifications to ensure that the ICIF are compatible with the technical specifications, operational control, and safety requirements of Transmission Owner and comment on such specifications within thirty (30) Calendar Days of Interconnection Customer's submission. All specifications provided hereunder shall be deemed confidential.

5.10.2 Transmission Owner's Review.

Transmission Owner's review of Interconnection Customer's final specifications shall not be construed as confirming, endorsing, or providing a warranty as to the design, fitness, safety, durability or reliability of the Large Generating Facility, or the ICIF. Interconnection Customer shall make such changes to the ICIF as may reasonably be required by Transmission Owner, in accordance with Good Utility Practice, to ensure that the ICIF are compatible with the technical specifications, operational control, and safety requirements of Transmission Owner.

5.10.3 ICIF Construction.

The ICIF shall be designed and constructed in accordance with Good Utility Practice. Within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Parties agree on another mutually acceptable deadline, Interconnection Customer shall deliver to Transmission Owner "as-built" drawings, information and documents for the ICIF, such as: a one-line diagram, a site plan showing the Large Generating Facility and the ICIF, plan and elevation drawings showing the layout of the ICIF, a relay functional diagram, relaying AC and DC schematic wiring diagrams and relay settings for all facilities associated with Interconnection Customer's step-up transformers, the facilities connecting the Large Generating Facility to the step-up transformers and the ICIF, and the impedances (determined by factory tests) for the associated step-up transformers and the Large Generating Facility. The Interconnection Customer shall provide Transmission Owner specifications for the excitation system, automatic voltage regulator, Large Generating Facility control and protection settings, transformer tap settings, and communications, if applicable.

5.11 Transmission Owner's Interconnection Facilities Construction.

Transmission Owner's Interconnection Facilities shall be designed and constructed in accordance with Good Utility Practice. Upon request, within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Parties agree on another mutually acceptable deadline, Transmission Owner shall deliver to Interconnection Customer the following "as-built" drawings, information and documents for Transmission Owner's Interconnection Facilities [include appropriate drawings and relay diagrams].

Transmission Owner will obtain control of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades upon completion of such facilities.

5.12 Access Rights.

Upon reasonable notice and supervision by a Party, and subject to any required or necessary

regulatory approvals, a Party ("Granting Party") shall furnish at no cost to the other Party ("Access Party") any rights of use, licenses, rights of way and easements with respect to lands owned or controlled by the Granting Party, its agents (if allowed under the applicable agency agreement), or any Affiliate, that are necessary to enable the Access Party to obtain ingress and egress to construct, operate, maintain, repair, test (or witness testing), inspect, replace or remove facilities and equipment to: (i) interconnect the Large Generating Facility with the Transmission System; (ii) operate and maintain the Large Generating Facility, the Interconnection Facilities and the Transmission System; and (iii) disconnect or remove the Access Party's facilities and equipment upon termination of this LGIA. In exercising such licenses, rights of way and easements, the Access Party shall not unreasonably disrupt or interfere with normal operation of the Granting Party's business and shall adhere to the safety rules and procedures established in advance, as may be changed from time to time, by the Granting Party and provided to the Access Party.

5.13 Lands of Other Property Owners.

If any part of Transmission Owner's Interconnection Facilities and/or Network Upgrades is to be installed on property owned by persons other than Interconnection Customer or Transmission Owner, Transmission Owner shall at Interconnection Customer's expense use efforts, similar in nature and extent to those that it typically undertakes on its own behalf or on behalf of its Affiliates, including use of its eminent domain authority, and to the extent consistent with state law, to procure from such persons any rights of use, licenses, rights of way and easements that are necessary to construct, operate, maintain, test, inspect, replace or remove Transmission Owner's Interconnection Facilities and/or Network Upgrades upon such property.

5.14 Permits.

Transmission Owner and Interconnection Customer shall cooperate with each other in good faith in obtaining all permits, licenses, and authorizations that are necessary to accomplish the interconnection in compliance with Applicable Laws and Regulations. With respect to this paragraph, Transmission Owner shall provide permitting assistance to Interconnection Customer comparable to that provided to Transmission Owner's own, or an Affiliate's generation.

5.15 Early Construction of Base Case Facilities.

Interconnection Customer may request Transmission Owner to construct, and Transmission Owner shall construct, using Reasonable Efforts to accommodate Interconnection Customer's In-Service Date, all or any portion of any Network Upgrades required for Interconnection Customer to be interconnected to the Transmission System which are included in the Base Case of the Facilities Study for Interconnection Customer, and which also are required to be constructed for another Interconnection Customer, but where such construction is not scheduled to be completed in time to achieve Interconnection Customer's In-Service Date.

5.16 Suspension.

Interconnection Customer reserves the right, upon written notice to Transmission Owner, to suspend at any time all work by Transmission Owner associated with the construction and installation of Transmission Owner's Interconnection Facilities and/or Network Upgrades required under this LGIA with the condition that Transmission System shall be left in a safe and reliable condition in accordance with Good Utility Practice and Transmission Owner's safety and reliability criteria. In such event, Interconnection Customer shall be responsible for all reasonable and necessary costs which Transmission Owner (i) has incurred pursuant to this LGIA prior to the suspension and (ii) incurs in suspending such work, including any costs

incurred to perform such work as may be necessary to ensure the safety of persons and property and the integrity of the Transmission System during such suspension and, if applicable, any costs incurred in connection with the cancellation or suspension of material, equipment and labor contracts which Transmission Owner cannot reasonably avoid; provided, however, that prior to canceling or suspending any such material, equipment or labor contract, Transmission Owner shall obtain Interconnection Customer's authorization to do so.

The Transmission Owner shall invoice Interconnection Customer for such costs pursuant to Article 12 and Transmission Owner shall use due diligence to minimize its costs. In the event Interconnection Customer suspends work by Transmission Owner required under this LGIA pursuant to this Article 5.16, and has not requested Transmission Owner to recommence the work required under this LGIA on or before the expiration of three (3) years following commencement of such suspension, this LGIA shall be deemed terminated. The three-year period shall begin on the date the suspension is requested, or the date of the written notice to Transmission Owner, if no effective date is specified.

5.17 Taxes.

5.17.1 Interconnection Customer Payments Not Taxable.

The Parties intend that all payments or property transfers made by Interconnection Customer to Transmission Owner for the installation of Transmission Owner's Interconnection Facilities and the Network Upgrades shall be non-taxable, either as contributions to capital, or as an advance, in accordance with the Internal Revenue Code and any applicable state income tax laws and shall not be taxable as contributions in aid of construction or otherwise under the Internal Revenue Code and any applicable state income tax laws.

5.17.2 Representations and Covenants.

In accordance with IRS Notice 2001-82 and IRS Notice 88-129, Interconnection Customer represents and covenants that (i) ownership of the electricity generated at the Large Generating Facility will pass to another party prior to the transmission of the electricity on the Transmission System, (ii) for income tax purposes, the amount of any payments and the cost of any property transferred to Transmission Owner for Transmission Owner's Interconnection Facilities will be capitalized by Interconnection Customer as an intangible asset and recovered using the straight-line method over a useful life of twenty (20) years, and (iii) any portion of Transmission Owner's Interconnection Facilities that is a "dual-use intertie," within the meaning of IRS Notice 88-129, is reasonably expected to carry only a de minimis amount of electricity in the direction of the Large Generating Facility. For this purpose, "de minimis amount" means no more than 5 percent of the total power flows in both directions, calculated in accordance with the "5 percent test" set forth in IRS Notice 88-129. This is not intended to be an exclusive list of the relevant conditions that must be met to conform to IRS requirements for nontaxable treatment.

At Transmission Owner's request, Interconnection Customer shall provide Transmission Owner with a report from an independent engineer confirming its representation in clause (iii), above. Transmission Owner represents and covenants that the cost of Transmission Owner's Interconnection Facilities paid for by Interconnection Customer will have no net effect on the base upon which rates are determined.

The foregoing representations and covenants are required and made only if there are payments or property transfers made by Interconnection Customer to Transmission

Owner for the installation of Transmission Owner's Interconnection Facilities or Network Upgrades.

5.17.3 Indemnification for the Cost Consequences of Current Tax Liability Imposed Upon the Transmission Owner.

Notwithstanding Article 5.17.1, Interconnection Customer shall protect, indemnify and hold harmless Transmission Owner from the cost consequences of any current tax liability imposed against Transmission Owner as the result of payments or property transfers made by Interconnection Customer to Transmission Owner under this LGIA for Interconnection Facilities, as well as any interest and penalties, other than interest and penalties attributable to any delay caused by Transmission Owner. Transmission Owner shall not include a gross-up for the cost consequences of any current tax liability in the amounts it charges Interconnection Customer under this LGIA unless (i) Transmission Owner has determined, in good faith, that the payments or property transfers made by Interconnection Customer to Transmission Owner should be reported as income subject to taxation or (ii) any Governmental Authority directs Transmission Owner to report payments or property as income subject to taxation; provided, however, that Transmission Owner may require Interconnection Customer to provide security for Interconnection Facilities, in a form reasonably acceptable to Transmission Owner (such as a parental guarantee or a letter of credit), in an amount equal to the cost consequences of any current tax liability under this Article 5.17. Interconnection Customer shall reimburse Transmission Owner for such costs on a fully grossed-up basis, in accordance with Article 5.17.4, within thirty (30) Calendar Days of receiving written notification from Transmission Owner of the amount due, including detail about how the amount was calculated.

The indemnification obligation shall terminate at the earlier of (1) the expiration of the ten year testing period and the applicable statute of limitation, as it may be extended by Transmission Owner upon request of the IRS, to keep these years open for audit or adjustment, or (2) the occurrence of a subsequent taxable event and the payment of any related indemnification obligations as contemplated by this Article 5.17.

5.17.4 Tax Gross-Up Amount.

Interconnection Customer's liability for the cost consequences of any current tax liability under this Article 5.17 shall be calculated on a fully grossed-up basis. Except as may otherwise be agreed to by the Parties, this means that Interconnection Customer will pay Transmission Owner, in addition to the amount paid for the Interconnection Facilities and Network Upgrades, an amount equal to (1) the current taxes imposed on Transmission Owner ("Current Taxes") on the excess of (a) the gross income realized by Transmission Owner as a result of payments or property transfers made by Interconnection Customer to Transmission Owner under this LGIA (without regard to any payments under this Article 5.17) (the "Gross Income Amount") over (b) the present value of future tax deductions for depreciation that will be available as a result of such payments or property transfers (the "Present Value Depreciation Amount"), plus (2) an additional amount sufficient to permit Transmission Owner to receive and retain, after the payment of all Current Taxes, an amount equal to the net amount described in clause (1).

For this purpose, (i) Current Taxes shall be computed based on Transmission Owner's composite federal and state tax rates at the time the payments or property

transfers are received and Transmission Owner will be treated as being subject to tax at the highest marginal rates in effect at that time (the "Current Tax Rate"), and (ii) the Present Value Depreciation Amount shall be computed by discounting Transmission Owner's anticipated tax depreciation deductions as a result of such payments or property transfers by Transmission Owner's current weighted average cost of capital. Thus, the formula for calculating Interconnection Customer's liability to Transmission Owner pursuant to this Article 5.17.4 can be expressed as follows: $(\text{Current Tax Rate} \times (\text{Gross Income Amount} - \text{Present Value of Tax Depreciation})) / (1 - \text{Current Tax Rate})$. Interconnection Customer's estimated tax liability in the event taxes are imposed shall be stated in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades.

5.17.5 Private Letter Ruling or Change or Clarification of Law.

At Interconnection Customer's request and expense, Transmission Owner shall file with the IRS a request for a private letter ruling as to whether any property transferred or sums paid, or to be paid, by Interconnection Customer to Transmission Owner under this LGIA are subject to federal income taxation.

Interconnection Customer will prepare the initial draft of the request for a private letter ruling, and will certify under penalties of perjury that all facts represented in such request are true and accurate to the best of Interconnection Customer's knowledge. Transmission Owner and Interconnection Customer shall cooperate in good faith with respect to the submission of such request.

Transmission Owner shall keep Interconnection Customer fully informed of the status of such request for a private letter ruling and shall execute either a privacy act waiver or a limited power of attorney, in a form acceptable to the IRS that authorizes Interconnection Customer to participate in all discussions with the IRS regarding such request for a private letter ruling. Transmission Owner shall allow Interconnection Customer to attend all meetings with IRS officials about the request and shall permit Interconnection Customer to prepare the initial drafts of any follow-up letters in connection with the request.

5.17.6 Subsequent Taxable Events.

If, within 10 years from the date on which the relevant Transmission Owner's Interconnection Facilities are placed in service, (i) Interconnection Customer Breaches the covenants contained in Article 5.17.2, (ii) a "disqualification event" occurs within the meaning of IRS Notice 88-129, or (iii) this LGIA terminates and Transmission Owner retains ownership of the Interconnection Facilities and Network Upgrades, Interconnection Customer shall pay a tax gross-up for the cost consequences of any current tax liability imposed on Transmission Owner, calculated using the methodology described in Article 5.17.4 and in accordance with IRS Notice 90-60.

5.17.7 Contests.

In the event any Governmental Authority determines that Transmission Owner's receipt of payments or property constitutes income that is subject to taxation, Transmission Owner shall notify Interconnection Customer, in writing, within thirty (30) Calendar Days of receiving notification of such determination by a Governmental Authority. Upon the timely written request by Interconnection Customer and at Interconnection Customer's sole expense, Transmission Owner may appeal, protest, seek abatement of, or otherwise oppose such determination. Upon Interconnection Customer's written request and sole expense, Transmission

Owner may file a claim for refund with respect to any taxes paid under this Article 5.17, whether or not it has received such a determination. Transmission Owner reserves the right to make all decisions with regard to the prosecution of such appeal, protest, abatement or other contest, including the selection of counsel and compromise or settlement of the claim, but Transmission Owner shall keep Interconnection Customer informed, shall consider in good faith suggestions from Interconnection Customer about the conduct of the contest, and shall reasonably permit Interconnection Customer or an Interconnection Customer representative to attend contest proceedings.

Interconnection Customer shall pay to Transmission Owner on a periodic basis, as invoiced by Transmission Owner, Transmission Owner's documented reasonable costs of prosecuting such appeal, protest, abatement or other contest. At any time during the contest, Transmission Owner may agree to a settlement either with Interconnection Customer's consent or after obtaining written advice from nationally-recognized tax counsel, selected by Transmission Owner, but reasonably acceptable to Interconnection Customer, that the proposed settlement represents a reasonable settlement given the hazards of litigation. Interconnection Customer's obligation shall be based on the amount of the settlement agreed to by Interconnection Customer, or if a higher amount, so much of the settlement that is supported by the written advice from nationally recognized tax counsel selected under the terms of the preceding sentence. The settlement amount shall be calculated on a fully grossed-up basis to cover any related cost consequences of the current tax liability. Any settlement without Interconnection Customer's consent or such written advice will relieve Interconnection Customer from any obligation to indemnify Transmission Owner for the tax at issue in the contest.

5.17.8

Refund.

In the event that (a) a private letter ruling is issued to Transmission Owner which holds that any amount paid or the value of any property transferred by Interconnection Customer to Transmission Owner under the terms of this LGIA is not subject to federal income taxation, (b) any legislative change or administrative announcement, notice, ruling or other determination makes it reasonably clear to Transmission Owner in good faith that any amount paid or the value of any property transferred by Interconnection Customer to Transmission Owner under the terms of this LGIA is not taxable to Transmission Owner, (c) any abatement, appeal, protest, or other contest results in a determination that any payments or transfers made by Interconnection Customer to Transmission Owner are not subject to federal income tax, or (d) if Transmission Owner receives a refund from any taxing authority for any overpayment of tax attributable to any payment or property transfer made by Interconnection Customer to Transmission Owner pursuant to this LGIA, Transmission Owner shall promptly refund to Interconnection Customer the following:

- (i) any payment made by Interconnection Customer under this Article 5.17 for taxes that is attributable to the amount determined to be non-taxable, together with interest thereon,
- (ii) interest on any amounts paid by Interconnection Customer to Transmission Owner for such taxes which Transmission Owner did not submit to the taxing authority, calculated in accordance with the methodology set forth in FERC's regulations at 18 CFR §35.19a(a)(2)(iii) from the date payment was made by

Interconnection Customer to the date Transmission Owner refunds such payment to Interconnection Customer, and
(iii) with respect to any such taxes paid by Transmission Owner, any refund or credit Transmission Owner receives or to which it may be entitled from any Governmental Authority, interest (or that portion thereof attributable to the payment described in clause (i), above) owed to Transmission Owner for such overpayment of taxes (including any reduction in interest otherwise payable by Transmission Owner to any Governmental Authority resulting from an offset or credit); provided, however, that Transmission Owner will remit such amount promptly to Interconnection Customer only after and to the extent that Transmission Owner has received a tax refund, credit or offset from any Governmental Authority for any applicable overpayment of income tax related to Transmission Owner's Interconnection Facilities.

The intent of this provision is to leave the Parties, to the extent practicable, in the event that no taxes are due with respect to any payment for Interconnection Facilities and Network Upgrades hereunder, in the same position they would have been in had no such tax payments been made.

5.17.9 Taxes Other Than Income Taxes.

Upon the timely request by Interconnection Customer, and at Interconnection Customer's sole expense, Transmission Owner may appeal, protest, seek abatement of, or otherwise contest any tax (other than federal or state income tax) asserted or assessed against Transmission Owner for which Interconnection Customer may be required to reimburse Transmission Owner under the terms of this LGIA.

Interconnection Customer shall pay to Transmission Owner on a periodic basis, as invoiced by Transmission Owner, Transmission Owner's documented reasonable costs of prosecuting such appeal, protest, abatement, or other contest.

Interconnection Customer and Transmission Owner shall cooperate in good faith with respect to any such contest. Unless the payment of such taxes is a prerequisite to an appeal or abatement or cannot be deferred, no amount shall be payable by Interconnection Customer to Transmission Owner for such taxes until they are assessed by a final, non-appealable order by any court or agency of competent jurisdiction. In the event that a tax payment is withheld and ultimately due and payable after appeal, Interconnection Customer will be responsible for all taxes, interest and penalties, other than penalties attributable to any delay caused by Transmission Owner.

5.18 Tax Status.

Each Party shall cooperate with the other to maintain the other Party's tax status. Nothing in this LGIA is intended to adversely affect any Transmission Owner's tax exempt status with respect to the issuance of bonds including, but not limited to, Local Furnishing Bonds.

5.19 Modification.

5.19.1 General.

Each Party may undertake modifications to its facilities. If a Party plans to undertake a modification that reasonably may be expected to affect the other Party's facilities, that Party shall provide to the other Party sufficient information regarding such modification so that the other Party may evaluate the potential impact of such modification prior to commencement of the work. Such information shall be deemed to be confidential hereunder and shall include information concerning the

timing of such modifications and whether such modifications are expected to interrupt the flow of electricity from the Large Generating Facility. The Party desiring to perform such work shall provide the relevant drawings, plans, and specifications to the other Party at least ninety (90) Calendar Days in advance of the commencement of the work or such shorter period upon which the Parties may agree, which agreement shall not unreasonably be withheld, conditioned or delayed. In the case of Large Generating Facility modifications that do not require Interconnection Customer to submit an Generator Interconnection Request, Transmission Owner shall provide to the Interconnection Customer, within thirty (30) Calendar Days (or such other time as the Parties may agree), an estimate of any additional modifications to the Transmission System, Transmission Owner's Interconnection Facilities or Network Upgrades necessitated by such Interconnection Customer modification and a good faith estimate of the costs thereof.

5.19.2 Standards.

Any additions, modifications, or replacements made to a Party's facilities shall be designed, constructed and operated in accordance with this LGIA and Good Utility Practice.

5.19.3 Modification Costs.

Interconnection Customer shall not be directly assigned for the costs of any additions, modifications, or replacements that Transmission Owner makes to Transmission Owner's Interconnection Facilities or the Transmission System to facilitate the interconnection of a third party to Transmission Owner's Interconnection Facilities or the Transmission System, or to provide transmission service to a third party under Transmission Owner's Tariff. Interconnection Customer shall be responsible for the costs of any additions, modifications, or replacements to Interconnection Customer's Interconnection Facilities that may be necessary to maintain or upgrade such Interconnection Customer's Interconnection Facilities consistent with Applicable Laws and Regulations, Applicable Reliability Standards or Good Utility Practice.

Article 6. Testing and Inspection

6.1 Pre-Commercial Operation Date Testing and Modifications.

Prior to the Commercial Operation Date, Transmission Owner shall test Transmission Owner's Interconnection Facilities and Network Upgrades and Interconnection Customer shall test the Large Generating Facility and Interconnection Customer's Interconnection Facilities to ensure their safe and reliable operation. Similar testing may be required after initial operation. Each Party shall make any modifications to its facilities that are found to be necessary as a result of such testing. Interconnection Customer shall bear the cost of all such testing and modifications. Interconnection Customer shall generate test energy at the Large Generating Facility only if it has arranged for the delivery of such test energy.

6.2 Post-Commercial Operation Date Testing and Modifications.

Each Party shall at its own expense perform routine inspection and testing of its facilities and equipment in accordance with Good Utility Practice as may be necessary to ensure the continued interconnection of the Large Generating Facility with the Transmission System in a safe and reliable manner. Each Party shall have the right, upon advance written notice, to

require reasonable additional testing of the other Party's facilities, at the requesting Party's expense, as may be in accordance with Good Utility Practice.

6.3 Right to Observe Testing.

Each Party shall notify the other Party in advance of its performance of tests of its Interconnection Facilities. The other Party has the right, at its own expense, to observe such testing.

6.4 Right to Inspect.

Each Party shall have the right, but shall have no obligation to: (i) observe the other Party's tests and/or inspection of any of its System Protection Facilities and other protective equipment, including Power System Stabilizers; (ii) review the settings of the other Party's System Protection Facilities and other protective equipment; and (iii) review the other Party's maintenance records relative to the Interconnection Facilities, the System Protection Facilities and other protective equipment. A Party may exercise these rights from time to time as it deems necessary upon reasonable notice to the other Party. The exercise or nonexercise by a Party of any such rights shall not be construed as an endorsement or confirmation of any element or condition of the Interconnection Facilities or the System Protection Facilities or other protective equipment or the operation thereof, or as a warranty as to the fitness, safety, desirability, or reliability of same. Any information that a Party obtains through the exercise of any of its rights under this Article 6.4 shall be deemed to be Confidential Information and treated pursuant to Article 22 of this LGIA.

Article 7. Metering

7.1 General.

Each Party shall comply with the Applicable Reliability Council requirements. Unless otherwise agreed by the Parties, Transmission Owner shall install Metering Equipment at the Point of Interconnection prior to any operation of the Large Generating Facility and shall own, operate, test and maintain such Metering Equipment. Power flows to and from the Large Generating Facility shall be measured at or, at Transmission Owner's option, compensated to, the Point of Interconnection. Transmission Owner shall provide metering quantities, in analog and/or digital form, to Interconnection Customer upon request. Interconnection Customer shall bear all reasonable documented costs associated with the purchase, installation, operation, testing and maintenance of the Metering Equipment.

7.2 Check Meters.

Interconnection Customer, at its option and expense, may install and operate, on its premises and on its side of the Point of Interconnection, one or more check meters to check Transmission Owner's meters. Such check meters shall be for check purposes only and shall not be used for the measurement of power flows for purposes of this LGIA, except as provided in Article 7.4 below. The check meters shall be subject at all reasonable times to inspection and examination by Transmission Owner or its designee. The installation, operation and maintenance thereof shall be performed entirely by Interconnection Customer in accordance with Good Utility Practice.

7.3 Standards.

The Transmission Owner shall install, calibrate, and test revenue quality Metering Equipment in accordance with applicable ANSI standards.

7.4 Testing of Metering Equipment.

The Transmission Owner shall inspect and test all Transmission Owner-owned Metering Equipment upon installation and at least once every two (2) years thereafter. If requested to do so by Interconnection Customer, Transmission Owner shall, at Interconnection Customer's expense, inspect or test Metering Equipment more frequently than every two (2) years. Transmission Owner shall give reasonable notice of the time when any inspection or test shall take place, and Interconnection Customer may have representatives present at the test or inspection. If at any time Metering Equipment is found to be inaccurate or defective, it shall be adjusted, repaired or replaced at Interconnection Customer's expense, in order to provide accurate metering, unless the inaccuracy or defect is due to Transmission Owner's failure to maintain, then Transmission Owner shall pay. If Metering Equipment fails to register, or if the measurement made by Metering Equipment during a test varies by more than two percent from the measurement made by the standard meter used in the test, Transmission Owner shall adjust the measurements by correcting all measurements for the period during which Metering Equipment was in error by using Interconnection Customer's check meters, if installed. If no such check meters are installed or if the period cannot be reasonably ascertained, the adjustment shall be for the period immediately preceding the test of the Metering Equipment equal to one-half the time from the date of the last previous test of the Metering Equipment.

7.5 Metering Data.

At Interconnection Customer's expense, the metered data shall be telemetered to one or more locations designated by Transmission Owner and one or more locations designated by Interconnection Customer. Such telemetered data shall be used, under normal operating conditions, as the official measurement of the amount of energy delivered from the Large Generating Facility to the Point of Interconnection.

Article 8. Communications

8.1 Interconnection Customer Obligations.

Interconnection Customer shall maintain satisfactory operating communications with Transmission Owner's Transmission System dispatcher or representative designated by Transmission Owner. Interconnection Customer shall provide standard voice line, dedicated voice line and facsimile communications at its Large Generating Facility control room or central dispatch facility through use of either the public telephone system, or a voice communications system that does not rely on the public telephone system. Interconnection Customer shall also provide the dedicated data circuit(s) necessary to provide Interconnection Customer data to Transmission Owner as set forth in Appendix D, Security Arrangements Details. The data circuit(s) shall extend from the Large Generating Facility to the location(s) specified by Transmission Owner. Any required maintenance of such communications equipment shall be performed by Interconnection Customer. Operational communications shall be activated and maintained under, but not be limited to, the following events: system paralleling or separation, scheduled and unscheduled shutdowns, equipment clearances, and hourly and daily load data.

8.2 Remote Terminal Unit.

Prior to the Initial Synchronization Date of the Large Generating Facility, a Remote Terminal Unit, or equivalent data collection and transfer equipment acceptable to the Parties, shall be installed by Interconnection Customer, or by Transmission Owner at Interconnection Customer's expense, to gather accumulated and instantaneous data to be telemetered to the location(s) designated by Transmission Owner through use of a dedicated point-to-point data

circuit(s) as indicated in Article 8.1. The communication protocol for the data circuit(s) shall be specified by Transmission Owner. Instantaneous bi-directional analog real power and reactive power flow information must be telemetered directly to the location(s) specified by Transmission Owner.

Each Party will promptly advise the other Party if it detects or otherwise learns of any metering, telemetry or communications equipment errors or malfunctions that require the attention and/or correction by the other Party. The Party owning such equipment shall correct such error or malfunction as soon as reasonably feasible.

8.3 No Annexation.

Any and all equipment placed on the premises of a Party shall be and remain the property of the Party providing such equipment regardless of the mode and manner of annexation or attachment to real property, unless otherwise mutually agreed by the Parties.

8.4 Provision of Data from a Variable Energy Resource

The Interconnection Customer whose Generating Facility is a Variable Energy Resource shall provide meteorological and forced outage data to the Transmission Owner to the extent necessary for the Transmission Owner's development and deployment of power production forecasts for that class of Variable Energy Resources. The Interconnection Customer with a Variable Energy Resource having wind as the energy source, at a minimum, will be required to provide the Transmission Owner with site-specific meteorological data including: temperature, wind speed, wind direction, and atmospheric pressure. The Interconnection Customer with a Variable Energy Resource having solar as the energy source, at a minimum, will be required to provide the Transmission Owner with site-specific meteorological data including: temperature, atmospheric pressure, and irradiance. The Transmission Owner and Interconnection Customer whose Generating Facility is a Variable Energy Resource shall mutually agree to any additional meteorological data that are required for the development and deployment of a power production forecast. The Interconnection Customer whose Generating Facility is a Variable Energy Resource also shall submit data to the Transmission Owner regarding all forced outages to the extent necessary for the Transmission Owner's development and deployment of power production forecasts for that class of Variable Energy Resources. The exact specifications of the meteorological and forced outage data to be provided by the Interconnection Customer to the Transmission Owner, including the frequency and timing of data submittals, shall be made taking into account the size and configuration of the Variable Energy Resource, its characteristics, location, and its importance in maintaining generation resource adequacy and transmission system reliability in its area. All requirements for meteorological and forced outage data must be commensurate with the power production forecasting employed by the Transmission Owner. Such requirements for meteorological and forced outage data are set forth in Appendix C, Interconnection Details, of this LGIA, as they may change from time to time.

Article 9. Operations

9.1 General.

Each Party shall comply with the Applicable Reliability Council requirements. Each Party shall provide to the other Party all information that may reasonably be required by the other Party to comply with Applicable Laws and Regulations and Applicable Reliability Standards.

9.2 Balancing Authority Area Notification.

At least three months before Initial Synchronization Date, Interconnection Customer shall

notify ITO and Transmission Owner in writing of the Balancing Authority Area in which the Large Generating Facility will be located. If Interconnection Customer elects to locate the Large Generating Facility in a Balancing Authority Area other than the Balancing Authority Area in which the Large Generating Facility is physically located, and if permitted to do so by the relevant transmission tariffs, all necessary arrangements, including but not limited to those set forth in Article 7 and Article 8 of this LGIA, and remote Balancing Authority Area generator interchange agreements, if applicable, and the appropriate measures under such agreements, shall be executed and implemented prior to the placement of the Large Generating Facility in the other Balancing Authority Area.

9.3 Transmission Owner Obligations.

The Transmission Owner shall cause the Transmission System and Transmission Owner's Interconnection Facilities to be operated, maintained and controlled in a safe and reliable manner and in accordance with this LGIA. Transmission Owner may provide operating instructions to Interconnection Customer consistent with this LGIA and Transmission Owner's operating protocols and procedures as they may change from time to time. Transmission Owner will consider changes to its operating protocols and procedures proposed by Interconnection Customer.

9.4 Interconnection Customer Obligations.

Interconnection Customer shall at its own expense operate, maintain and control the Large Generating Facility and Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA. Interconnection Customer shall operate the Large Generating Facility and Interconnection Customer's Interconnection Facilities in accordance with all applicable requirements of the Balancing Authority Area of which it is part, as such requirements are set forth in Appendix C, Interconnection Details, of this LGIA. Appendix C, Interconnection Details, will be modified to reflect changes to the requirements as they may change from time to time. Either Party may request that the other Party provide copies of the requirements set forth in Appendix C, Interconnection Details, of this LGIA.

9.5 Start-Up and Synchronization.

Consistent with the Parties' mutually acceptable procedures, Interconnection Customer is responsible for the proper synchronization of the Large Generating Facility to Transmission Owner's Transmission System.

9.6 Reactive Power and Primary Frequency Response.

9.6.1 Power Factor Design Criteria.

9.6.1.1 Synchronous Generation.

Interconnection Customer shall design the Large Generating Facility to maintain a composite power delivery at continuous rated power output at the Point of Interconnection at a power factor within the range of 0.95 leading to 0.95 lagging, unless the Transmission Owner has established different requirements that apply to all synchronous generators in the Balancing Authority Area on a comparable basis.

9.6.1.2 Non-Synchronous Generation.

Interconnection Customer shall design the Large Generating Facility 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 0.95 leading to 0.95 lagging, unless the Transmission Owner has established a different power factor range that applies to all non-synchronous generators in the Balancing Authority Area on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors, or a combination of the two. This requirement shall only apply to newly interconnecting non-synchronous generators that have not yet executed a Facilities Study Agreement as of the effective date of the Final Rule establishing this requirement (Order No. 827).

9.6.2 Voltage Schedules.

Once Interconnection Customer has synchronized the Large Generating Facility with the Transmission System, Transmission Owner shall require Interconnection Customer to operate the Large Generating Facility to produce or absorb reactive power within the design limitations of the Large Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). Transmission Owner's voltage schedules shall treat all sources of reactive power in the Balancing Authority Area in an equitable and not unduly discriminatory manner. Transmission Owner shall exercise Reasonable Efforts to provide Interconnection Customer with such schedules at least one (1) day in advance, and may make changes to such schedules as necessary to maintain the reliability of the Transmission System. Interconnection Customer shall operate the Large Generating Facility to maintain the specified output voltage or power factor at the Point of Interconnection within the design limitations of the Large Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). If Interconnection Customer is unable to maintain the specified voltage or power factor, it shall promptly notify the System Operator.

9.6.2.1 Voltage Regulators.

Whenever the Large Generating Facility is operated in parallel with the Transmission System and voltage regulators are capable of operation, Interconnection Customer shall operate the Large Generating Facility with its and voltage regulators in automatic operation. If the Large Generating Facility's speed governors and voltage regulators are not capable of such automatic operation, Interconnection Customer shall immediately notify Transmission Owner, or its designated representative, and ensure that such Large Generating Facility's reactive power production or absorption (measured in MVARs) are within the design capability of the Large Generating Facility's generating unit(s) and steady state stability limits. Interconnection Customer shall not cause its Large Generating Facility to disconnect automatically or instantaneously from the Transmission System or trip any generating unit comprising the Large Generating Facility for an under or over frequency condition unless the abnormal frequency condition persists for a time period beyond the limits set forth in ANSI/IEEE Standard C37.106, or such other standard as applied to other generators in the Balancing Authority Area on a comparable basis.

9.6.3 Payment for Reactive Power.

Transmission Owner is required to pay Interconnection Customer for reactive power that Interconnection Customer provides or absorbs from the Large Generating Facility when Transmission Owner requests Interconnection Customer to operate its Large Generating Facility outside the range specified in Article 9.6.1, provided that if Transmission Owner pays its own or affiliated generators for reactive power service within the specified range, Transmission Owner must also pay Interconnection Customer. Payments shall be pursuant to Article 11.6 or such other agreement to which the Parties have otherwise agreed.

9.6.4 Primary Frequency Response

Interconnection Customer shall ensure the primary frequency response capability of its Large Generating Facility by installing, maintaining, and operating a functioning governor or equivalent controls. The term “functioning governor or equivalent controls” as used herein shall mean the required hardware and/or software that provides frequency responsive real power control with the ability to sense changes in system frequency and autonomously adjust the Large Generating Facility’s real power output in accordance with the droop and deadband parameters and in the direction needed to correct frequency deviations. Interconnection Customer is required to install a governor or equivalent controls with the capability of operating: (1) with a maximum 5 percent droop and ± 0.036 Hz deadband; or (2) in accordance with the relevant droop, deadband, and timely and sustained response settings from an approved NERC Reliability Standard providing for equivalent or more stringent parameters. The droop characteristic shall be: (1) based on the nameplate capacity of the Large Generating Facility, and shall be linear in the range of frequencies between 59 to 61 Hz that are outside of the deadband parameter; or (2) based on an approved NERC Reliability Standard providing for an equivalent or more stringent parameter. The deadband parameter shall be: the range of frequencies above and below nominal (60 Hz) in which the governor or equivalent controls is not expected to adjust the Large Generating Facility’s real power output in response to frequency deviations. The deadband shall be implemented: (1) without a step to the droop curve, that is, once the frequency deviation exceeds the deadband parameter, the expected change in the Large Generating Facility’s real power output in response to frequency deviations shall start from zero and then increase (for under-frequency deviations) or decrease (for over-frequency deviations) linearly in proportion to the magnitude of the frequency deviation; or (2) in accordance with an approved NERC Reliability Standard providing for an equivalent or more stringent parameter. Interconnection Customer shall notify Transmission Owner that the primary frequency response capability of the Large Generating Facility has been tested and confirmed during commissioning. Once Interconnection Customer has synchronized the Large Generating Facility with the Transmission System, Interconnection Customer shall operate the Large Generating Facility consistent with the provisions specified in Sections 9.6.4.1 and 9.6.4.2 of this Agreement. The primary frequency response requirements contained herein shall apply to both synchronous and non-synchronous Large Generating Facilities.

9.6.4.1 Governor or Equivalent Controls. Whenever the Large Generating Facility is operated in parallel with the Transmission System, Interconnection Customer shall operate the Large Generating Facility with its governor or equivalent controls in service and responsive to frequency. Interconnection Customer shall: (1) in coordination with

Transmission Owner and/or the relevant balancing authority, set the deadband parameter to: (1) a maximum of ± 0.036 Hz and set the droop parameter to a maximum of 5 percent; or (2) implement the relevant droop and deadband settings from an approved NERC Reliability Standard that provides for equivalent or more stringent parameters. Interconnection Customer shall be required to provide the status and settings of the governor or equivalent controls to Transmission Owner and/or the relevant balancing authority upon request. If Interconnection Customer needs to operate the Large Generating Facility with its governor or equivalent controls not in service, Interconnection Customer shall immediately notify Transmission Owner and the relevant balancing authority, and provide both with the following information: (1) the operating status of the governor or equivalent controls (i.e., whether it is currently out of service or when it will be taken out of service); (2) the reasons for removing the governor or equivalent controls from service; and (3) a reasonable estimate of when the governor or equivalent controls will be returned to service. Interconnection Customer shall make Reasonable Efforts to return its governor or equivalent controls into service as soon as practicable. Interconnection Customer shall make Reasonable Efforts to keep outages of the Large Generating Facility's governor or equivalent controls to a minimum whenever the Large Generating Facility is operated in parallel with the Transmission System.

9.6.4.2 Timely and Sustained Response. Interconnection Customer shall ensure that the Large Generating Facility's real power response to sustained frequency deviations outside of the deadband setting is automatically provided and shall begin immediately after frequency deviates outside of the deadband, and to the extent the Large Generating Facility has operating capability in the direction needed to correct the frequency deviation. Interconnection Customer shall not block or otherwise inhibit the ability of the governor or equivalent controls to respond and shall ensure that the response is not inhibited, except under certain operational constraints including, but not limited to, ambient temperature limitations, physical energy limitations, outages of mechanical equipment, or regulatory requirements. The Large Generating Facility shall sustain the real power response at least until system frequency returns to a value within the deadband setting of the governor or equivalent controls. A Commission-approved Reliability Standard with equivalent or more stringent requirements shall supersede the above requirements.

9.6.4.3 Exemptions. Large Generating Facilities that are regulated by the United States Nuclear Regulatory Commission shall be exempt from Sections 9.6.4, 9.6.4.1, and 9.6.4.2 of this Agreement. Large Generating Facilities that are behind the meter generation that is sized-to-load (i.e., the thermal load and the generation are near-balanced in real-time operation and the generation is primarily controlled to maintain the unique thermal, chemical, or mechanical output necessary for the operating requirements of its host facility) shall be required to install primary frequency response capability in accordance with the droop and deadband capability requirements specified in Section 9.6.4, but shall be otherwise exempt from the operating requirements in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.4 of this Agreement.

9.6.4.4 Electric Storage Resources. Interconnection Customer interconnecting an electric storage resource shall establish an operating range in Appendix C of its LGIA

that specifies a minimum state of charge and a maximum state of charge between which the electric storage resource will be required to provide primary frequency response consistent with the conditions set forth in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.3 of this Agreement. Appendix C shall specify whether the operating range is static or dynamic, and shall consider (1) the expected magnitude of frequency deviations in the interconnection; (2) the expected duration that system frequency will remain outside of the deadband parameter in the interconnection; (3) the expected incidence of frequency deviations outside of the deadband parameter in the interconnection; (4) the physical capabilities of the electric storage resource; (5) operational limitations of the electric storage resource due to manufacturer specifications; and (6) any other relevant factors agreed to by Transmission Owner and Interconnection Customer, and in consultation with the relevant transmission owner or balancing authority as appropriate. If the operating range is dynamic, then Appendix C must establish how frequently the operating range will be reevaluated and the factors that may be considered during its reevaluation.

Interconnection Customer's electric storage resource is required to provide timely and sustained primary frequency response consistent with Section 9.6.4.2 of this Agreement when it is online and dispatched to inject electricity to the Transmission System and/or receive electricity from the Transmission System. This excludes circumstances when the electric storage resource is not dispatched to inject electricity to the Transmission System and/or dispatched to receive electricity from the Transmission System. If Interconnection Customer's electric storage resource is charging at the time of a frequency deviation outside of its deadband parameter, it is to increase (for over-frequency deviations) or decrease (for under-frequency deviations) the rate at which it is charging in accordance with its droop parameter. Interconnection Customer's electric storage resource is not required to change from charging to discharging, or vice versa, unless the response necessitated by the droop and deadband settings requires it to do so and it is technically capable of making such a transition.

9.7 Outages and Interruptions.

9.7.1 Outages.

9.7.1.1 Outage Authority and Coordination.

Each Party may in accordance with Good Utility Practice in coordination with the other Party remove from service any of its respective Interconnection Facilities or Network Upgrades that may impact the other Party's facilities as necessary to perform maintenance or testing or to install or replace equipment. Absent an Emergency Condition, the Party scheduling a removal of such facility(ies) from service will use Reasonable Efforts to schedule such removal on a date and time mutually acceptable to the Parties. In all circumstances, any Party planning to remove such facility(ies) from service shall use Reasonable Efforts to minimize the effect on the other Party of such removal.

9.7.1.2 Outage Schedules.

ITO shall post scheduled outages of the transmission facilities on the OASIS. Interconnection Customer shall submit its planned maintenance schedules for the Large Generating Facility to the ITO and Transmission

Owner for a minimum of a rolling twenty-four month period. Interconnection Customer shall update its planned maintenance schedules as necessary. Transmission Owner may request Interconnection Customer to reschedule its maintenance as necessary to maintain the reliability of the Transmission System; provided, however, adequacy of generation supply shall not be a criterion in determining Transmission System reliability. Transmission Owner shall compensate Interconnection Customer for any additional direct costs that Interconnection Customer incurs as a result of having to reschedule maintenance, including any additional overtime, breaking of maintenance contracts or other costs above and beyond the cost Interconnection Customer would have incurred absent Transmission Owner's request to reschedule maintenance. Interconnection Customer will not be eligible to receive compensation, if during the twelve (12) months prior to the date of the scheduled maintenance, Interconnection Customer had modified its schedule of maintenance activities.

9.7.1.3 Outage Restoration.

If an outage on a Party's Interconnection Facilities or Network Upgrades adversely affects the other Party's operations or facilities, the Party that owns or controls the facility that is out of service shall use Reasonable Efforts to promptly restore such facility(ies) to a normal operating condition consistent with the nature of the outage. The Party that owns or controls the facility that is out of service shall provide the other Party, to the extent such information is known, information on the nature of the Emergency Condition, an estimated time of restoration, and any corrective actions required. Initial verbal notice shall be followed up as soon as practicable with written notice explaining the nature of the outage.

9.7.2 Interruption of Service.

If required by Good Utility Practice to do so, Transmission Owner may require Interconnection Customer to interrupt or reduce deliveries of electricity if such delivery of electricity could adversely affect Transmission Owner's ability to perform such activities as are necessary to safely and reliably operate and maintain the Transmission System. The following provisions shall apply to any interruption or reduction permitted under this Article 9.7.2:

9.7.2.1 The interruption or reduction shall continue only for so long as reasonably necessary under Good Utility Practice;

9.7.2.2 Any such interruption or reduction shall be made on an equitable, non-discriminatory basis with respect to all generating facilities directly connected to the Transmission System;

9.7.2.3 When the interruption or reduction must be made under circumstances which do not allow for advance notice, Transmission Owner shall notify Interconnection Customer by telephone as soon as practicable of the reasons for the curtailment, interruption, or reduction, and, if known, its expected duration. Telephone notification shall be followed by written notification as soon as practicable;

9.7.2.4 Except during the existence of an Emergency Condition, when the interruption or reduction can be scheduled without advance notice,

Transmission Owner or Reliability Coordinator shall notify Interconnection Customer in advance regarding the timing of such scheduling and further notify Interconnection Customer of the expected duration. Transmission Owner shall coordinate with Interconnection Customer using Good Utility Practice to schedule the interruption or reduction during periods of least impact to Interconnection Customer and Transmission Owner;

9.7.2.5 The Parties shall cooperate and coordinate with each other to the extent necessary in order to restore the Large Generating Facility, Interconnection Facilities, and the Transmission System to their normal operating state, consistent with system conditions and Good Utility Practice.

9.7.3 Under-Frequency and Over-Frequency Conditions.

The Transmission System is designed to automatically activate a loadshed program as required by the Applicable Reliability Council in the event of an under-frequency system disturbance. Interconnection Customer shall implement under-frequency and over-frequency relay set points for the Large Generating Facility as required by the Applicable Reliability Council to ensure "ride through" capability of the Transmission System. Large Generating Facility response to frequency deviations of pre-determined magnitudes, both under-frequency and over-frequency deviations, shall be studied and coordinated with Transmission Owner in accordance with Good Utility Practice. The term "ride through" as used herein shall mean the ability of a Generating Facility to stay connected to and synchronized with the Transmission System during system disturbances within a range of under-frequency and over-frequency conditions, in accordance with Good Utility Practice.

9.7.4 System Protection and Other Control Requirements.

9.7.4.1 System Protection Facilities.

Interconnection Customer shall, at its expense, install, operate and maintain System Protection Facilities as a part of the Large Generating Facility or Interconnection Customer's Interconnection Facilities. Transmission Owner shall install at Interconnection Customer's expense any System Protection Facilities that may be required on Transmission Owner's Interconnection Facilities or the Transmission System as a result of the interconnection of the Large Generating Facility and Interconnection Customer's Interconnection Facilities.

9.7.4.2 Each Party's protection facilities shall be designed and coordinated with other systems in accordance with Good Utility Practice.

9.7.4.3 Each Party shall be responsible for protection of its facilities consistent with Good Utility Practice.

9.7.4.4 Each Party's protective relay design shall incorporate the necessary test switches to perform the tests required in Article 6. The required test switches will be placed such that they allow operation of lockout relays while preventing breaker failure schemes from operating and causing unnecessary breaker operations and/or the tripping of Interconnection Customer's units.

9.7.4.5 Each Party will test, operate and maintain System Protection Facilities in accordance with Good Utility Practice.

9.7.4.6 Prior to the In-Service Date, and again prior to the Commercial

Operation Date, each Party or its agent shall perform a complete calibration test and functional trip test of the System Protection Facilities. At intervals suggested by Good Utility Practice and following any apparent malfunction of the System Protection Facilities, each Party shall perform both calibration and functional trip tests of its System Protection Facilities. These tests do not require the tripping of any in-service generation unit. These tests do, however, require that all protective relays and lockout contacts be activated.

9.7.5 Requirements for Protection.

In compliance with Good Utility Practice, Interconnection Customer shall provide, install, own, and maintain relays, circuit breakers and all other devices necessary to remove any fault contribution of the Large Generating Facility to any short circuit occurring on the Transmission System not otherwise isolated by Transmission Owner's equipment, such that the removal of the fault contribution shall be coordinated with the protective requirements of the Transmission System. Such protective equipment shall include, without limitation, a disconnecting device or switch with load-interrupting capability located between the Large Generating Facility and the Transmission System at a site selected upon mutual agreement (not to be unreasonably withheld, conditioned or delayed) of the Parties. Interconnection Customer shall be responsible for protection of the Large Generating Facility and Interconnection Customer's other equipment from such conditions as negative sequence currents, over- or under-frequency, sudden load rejection, over- or undervoltage, and generator loss-of-field. Interconnection Customer shall be solely responsible to disconnect the Large Generating Facility and Interconnection Customer's other equipment if conditions on the Transmission System could adversely affect the Large Generating Facility.

9.7.6 Power Quality.

No Party's facilities shall cause excessive voltage flicker nor introduce excessive distortion to the sinusoidal voltage or current waves as defined by ANSI Standard C84.1-1989, in accordance with IEEE Standard 519, or any applicable superseding electric industry standard. In the event of a conflict between ANSI Standard C84.1-1989, or any applicable superseding electric industry standard, ANSI Standard C84.1-1989, or the applicable superseding electric industry standard, shall control.

9.8 Switching and Tagging Rules.

Each Party shall provide the other Party a copy of its switching and tagging rules that are applicable to the other Party's activities. Such switching and tagging rules shall be developed on a non-discriminatory basis. The Parties shall comply with applicable switching and tagging rules, as amended from time to time, in obtaining clearances for work or for switching operations on equipment.

9.9 Use of Interconnection Facilities by Third Parties.

9.9.1 Purpose of Interconnection Facilities.

Except as may be required by Applicable Laws and Regulations, or as otherwise agreed to between the Parties, the Interconnection Facilities shall be constructed for the sole purpose of interconnecting the Large Generating Facility to the Transmission System and shall be used for no other purpose.

9.9.2 Third Party Users.

If required by Applicable Laws and Regulations or if the Parties mutually agree, such agreement not to be unreasonably withheld, to allow one or more third parties to use Transmission Owner's Interconnection Facilities, or any part thereof, Interconnection Customer will be entitled to compensation for the capital expenses it incurred in connection with the Interconnection Facilities based upon the pro rata use of the Interconnection Facilities by Transmission Owner, all third party users, and Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually-agreed upon methodology. In addition, cost responsibility for ongoing costs, including operation and maintenance costs associated with the Interconnection Facilities, will be allocated between Interconnection Customer and any third party users based upon the pro rata use of the Interconnection Facilities by Transmission Owner, all third party users, and Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually agreed upon methodology. If the issue of such compensation or allocation cannot be resolved through such negotiations, it shall be submitted to FERC for resolution.

9.10 Disturbance Analysis Data Exchange.

The Parties will cooperate with one another in the analysis of disturbances to either the Large Generating Facility or Transmission Owner's Transmission System by gathering and providing access to any information relating to any disturbance, including information from oscillography, protective relay targets, breaker operations and sequence of events records, and any disturbance information required by Good Utility Practice.

Article 10. Maintenance

10.1 Transmission Owner Obligations.

Transmission Owner shall maintain the Transmission System and Transmission Owner's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.2 Interconnection Customer Obligations.

Interconnection Customer shall maintain the Large Generating Facility and Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.3 Coordination.

The Parties shall confer regularly to coordinate the planning, scheduling and performance of preventive and corrective maintenance on the Large Generating Facility and the Interconnection Facilities.

10.4 Secondary Systems.

Each Party shall cooperate with the other Party in the inspection, maintenance, and testing of control or power circuits that operate below 600 volts, AC or DC, including, but not limited to, any hardware, control or protective devices, cables, conductors, electric raceways, secondary equipment panels, transducers, batteries, chargers, and voltage and current transformers that directly affect the operation of a Party's facilities and equipment which may reasonably be expected to impact the other Party. Each Party shall provide advance notice to the other Party before undertaking any work on such circuits, especially on electrical circuits involving circuit breaker trip and close contacts, current transformers, or potential transformers.

10.5 Operating and Maintenance Expenses.

Subject to the provisions herein addressing the use of facilities by others, and except for operations and maintenance expenses associated with modifications made for providing interconnection or transmission service to a third party and such third party pays for such expenses, Interconnection Customer shall be responsible for all reasonable expenses including overheads, associated with: (1) owning, operating, maintaining, repairing, and replacing Interconnection Customer's Interconnection Facilities; and (2) operation, maintenance, repair and replacement of Transmission Owner's Interconnection Facilities.

Article 11. Performance Obligation

11.1 Interconnection Customer Interconnection Facilities.

Interconnection Customer shall design, procure, construct, install, own and/or control Interconnection Customer Interconnection Facilities described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades, at its sole expense.

11.2 Transmission Owner's Interconnection Facilities.

Transmission Owner shall design, procure, construct, install, own and/or control the Transmission Owner's Interconnection Facilities described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades, at the sole expense of the Interconnection Customer.

11.3 Network Upgrades and Distribution Upgrades.

Transmission Owner shall design, procure, construct, install, and own the Network Upgrades and Distribution Upgrades described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades. The Interconnection Customer shall be responsible for all costs related to Distribution Upgrades. Unless Transmission Owner elects to fund the capital for the Network Upgrades, they shall be solely funded by Interconnection Customer.

11.4 Transmission Credits.

11.4.1 Repayment of Amounts Advanced for Network Upgrades.

Interconnection Customer shall be entitled to a cash repayment, equal to the total amount paid to Transmission Owner and Affected System Operator, if any, for the Network Upgrades, including any tax gross-up or other tax-related payments associated with Network Upgrades, and not refunded to Interconnection Customer pursuant to Article 5.17.8 or otherwise, to be paid to Interconnection Customer on a dollar-for-dollar basis for the nonusage sensitive portion of transmission charges, as payments are made under Transmission Owner's Tariff and Affected System's Tariff for transmission services with respect to the Large Generating Facility. Any repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 CFR § 35.19a(a)(2)(iii) from the date of any payment for Network Upgrades through the date on which the Interconnection Customer receives a repayment of such payment pursuant to this subparagraph. Interconnection Customer may assign such repayment rights to any person. Notwithstanding the foregoing, Interconnection Customer, Transmission Owner, and Affected System Operator may adopt any alternative payment schedule that is mutually agreeable so long as Transmission Owner and Affected System Operator take one of the following actions no later than five years from the Commercial Operation Date: (1) return to Interconnection Customer any amounts advanced for Network Upgrades not previously repaid, or (2) declare in writing that Transmission Owner or Affected System Operator will continue to provide payments to

Interconnection Customer on a dollar-for-dollar basis for the non-usage sensitive portion of transmission charges, or develop an alternative schedule that is mutually agreeable and provides for the return of all amounts advanced for Network Upgrades not previously repaid; however, full reimbursement shall not extend beyond twenty (20) years from the Commercial Operation Date.

If the Large Generating Facility fails to achieve commercial operation, but it or another Generating Facility is later constructed and makes use of the Network Upgrades, Transmission Owner and Affected System Operator shall at that time reimburse Interconnection Customer for the amounts advanced for the Network Upgrades. Before any such reimbursement can occur, the Interconnection Customer, or the entity that ultimately constructs the Generating Facility, if different, is responsible for identifying the entity to which reimbursement must be made.

11.4.2 Special Provisions for Affected Systems.

Unless Transmission Owner provides, under the LGIA, for the repayment of amounts advanced to Affected System Operator for Network Upgrades, Interconnection Customer and Affected System Operator shall enter into an agreement that provides for such repayment. The agreement shall specify the terms governing payments to be made by Interconnection Customer to the Affected System Operator as well as the repayment by the Affected System Operator.

11.4.3 Notwithstanding any other provision of this LGIA, nothing herein shall be construed as relinquishing or foreclosing any rights, including but not limited to firm transmission rights, capacity rights, transmission congestion rights, or transmission credits, that Interconnection Customer, shall be entitled to, now or in the future under any other agreement or tariff as a result of, or otherwise associated with, the transfer capability, if any, created by the Network Upgrades, including the right to obtain cash reimbursements or transmission credits for transmission service that is not associated with the Large Generating Facility.

11.5 Provision of Security.

At least thirty (30) Calendar Days prior to the commencement of the procurement, installation, or construction of a discrete portion of a Transmission Owner's Interconnection Facilities, Network Upgrades, or Distribution Upgrades, Interconnection Customer shall provide Transmission Owner, at Interconnection Customer's option, a guarantee, a surety bond, letter of credit or other form of security that is reasonably acceptable to Transmission Owner and is consistent with the Uniform Commercial Code of the jurisdiction identified in Article 14.2.1. Such security for payment shall be in an amount sufficient to cover the costs for constructing, procuring and installing the applicable portion of Transmission Owner's Interconnection Facilities, Network Upgrades, or Distribution Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to Transmission Owner for these purposes.

In addition:

- 11.5.1** The guarantee must be made by an entity that meets the creditworthiness requirements of Transmission Owner, and contain terms and conditions that guarantee payment of any amount that may be due from Interconnection Customer, up to an agreed-to maximum amount.
- 11.5.2** The letter of credit must be issued by a financial institution reasonably acceptable to Transmission Owner and must specify a reasonable expiration date.
- 11.5.3** The surety bond must be issued by an insurer reasonably acceptable to Transmission

Owner and must specify a reasonable expiration date.

11.6 Interconnection Customer Compensation.

If Transmission Owner requests or directs Interconnection Customer to provide a service pursuant to Articles 9.6.3 (Payment for Reactive Power), or 13.5.1 of this LGIA, Transmission Owner shall compensate Interconnection Customer in accordance with Interconnection Customer's applicable rate schedule then in effect unless the provision of such service(s) is subject to an RTO or ISO FERC-approved rate schedule. Interconnection Customer shall serve Transmission Owner or RTO or ISO with any filing of a proposed rate schedule at the time of such filing with FERC. To the extent that no rate schedule is in effect at the time the Interconnection Customer is required to provide or absorb any Reactive Power under this LGIA, Transmission Owner agrees to compensate Interconnection Customer in such amount as would have been due Interconnection Customer had the rate schedule been in effect at the time service commenced; provided, however, that such rate schedule must be filed at FERC or other appropriate Governmental Authority within sixty (60) Calendar Days of the commencement of service.

11.6.1 Interconnection Customer Compensation for Actions During Emergency Condition.

Transmission Owner shall compensate Interconnection Customer for its provision of real and reactive power and other Emergency Condition services that Interconnection Customer provides to support the Transmission System during an Emergency Condition in accordance with Article 11.6.

Article 12. Invoice

12.1 General.

Each Party shall submit to the other Party, on a monthly basis, invoices of amounts due for the preceding month. Each invoice shall state the month to which the invoice applies and fully describe the services and equipment provided. The Parties may discharge mutual debts and payment obligations due and owing to each other on the same date through netting, in which case all amounts a Party owes to the other Party under this LGIA, including interest payments or credits, shall be netted so that only the net amount remaining due shall be paid by the owing Party.

12.2 Final Invoice.

Within six months after completion of the construction of Transmission Owner's Interconnection Facilities and the Network Upgrades, Transmission Owner shall provide an invoice of the final cost of the construction of Transmission Owner's Interconnection Facilities and the Network Upgrades and shall set forth such costs in sufficient detail to enable Interconnection Customer to compare the actual costs with the estimates and to ascertain deviations, if any, from the cost estimates. Transmission Owner shall refund to Interconnection Customer any amount by which the actual payment by Interconnection Customer for estimated costs exceeds the actual costs of construction within thirty (30) Calendar Days of the issuance of such final construction invoice.

12.3 Payment.

Invoices shall be rendered to the paying Party at the address specified in Appendix F. The Party receiving the invoice shall pay the invoice within thirty (30) Calendar Days of receipt. All payments shall be made in immediately available funds payable to the other Party, or by wire transfer to a bank named and account designated by the invoicing Party. Payment of

invoices by any Party will not constitute a waiver of any rights or claims either Party may have under this LGIA.

12.4 Disputes.

In the event of a billing dispute between Transmission Owner and Interconnection Customer, Transmission Owner shall continue to provide Interconnection Service under this LGIA as long as Interconnection Customer: (i) continues to make all payments not in dispute; and (ii) pays to Transmission Owner or into an independent escrow account the portion of the invoice in dispute, pending resolution of such dispute. If Interconnection Customer fails to meet these two requirements for continuation of service, then Transmission Owner may provide notice to Interconnection Customer of a Default pursuant to Article 17. Within thirty (30) Calendar Days after the resolution of the dispute, the Party that owes money to the other Party shall pay the amount due with interest calculated in accord with the methodology set forth in FERC's regulations at 18 CFR § a(a)(2)(iii).

Article 13. Emergencies

13.1 Definition.

"Emergency Condition" shall mean a condition or situation: (i) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (ii) that, in the case of Transmission Owner, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to the Transmission System, Transmission Owner's Interconnection Facilities or the Transmission Systems of others to which the Transmission System is directly connected; or (iii) that, in the case of Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Large Generating Facility or Interconnection Customer's Interconnection Facilities' System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by this LGIA to possess black start capability.

13.2 Obligations.

Each Party shall comply with the Emergency Condition procedures of the applicable Reliability Coordinator, NERC, the Applicable Reliability Council, Applicable Laws and Regulations, and any emergency procedures agreed to by the Joint Operating Committee.

13.3 Notice.

Transmission Owner shall notify Interconnection Customer promptly when it becomes aware of an Emergency Condition that affects Transmission Owner's Interconnection Facilities or the Transmission System that may reasonably be expected to affect Interconnection Customer's operation of the Large Generating Facility or Interconnection Customer's Interconnection Facilities. Interconnection Customer shall notify Transmission Owner promptly when it becomes aware of an Emergency Condition that affects the Large Generating Facility or Interconnection Customer's Interconnection Facilities that may reasonably be expected to affect the Transmission System or Transmission Owner's Interconnection Facilities. To the extent information is known, the notification shall describe the Emergency Condition, the extent of the damage or deficiency, the expected effect on the operation of Interconnection Customer's or Transmission Owner's facilities and operations, its anticipated duration and the corrective action taken and/or to be taken. The initial notice shall be followed as soon as practicable with written notice.

13.4 Immediate Action.

Unless, in Interconnection Customer's reasonable judgment, immediate action is required, Interconnection Customer shall obtain the consent of Transmission Owner, such consent to not be unreasonably withheld, prior to performing any manual switching operations at the Large Generating Facility or Interconnection Customer's Interconnection Facilities in response to an Emergency Condition either declared by Transmission Owner or otherwise regarding the Transmission System.

13.5 Reliability Coordinator's Authority.

13.5.1 General.

Reliability Coordinator may take whatever actions or inactions with regard to the Transmission System or Transmission Owner's Interconnection Facilities it deems necessary during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the Transmission System or Transmission Owner's Interconnection Facilities, (iii) limit or prevent damage, and (iv) expedite restoration of service.

Reliability Coordinator shall use Reasonable Efforts to minimize the effect of such actions or inactions on the Large Generating Facility or Interconnection Customer's Interconnection Facilities. Reliability Coordinator may, on the basis of technical considerations, require the Large Generating Facility to mitigate an Emergency Condition by taking actions necessary and limited in scope to remedy the Emergency Condition, including, but not limited to, directing Interconnection Customer to shut-down, start-up, increase or decrease the real or reactive power output of the Large Generating Facility; implementing a reduction or disconnection pursuant to Article 13.5.2; directing Interconnection Customer to assist with blackstart (if available) or restoration efforts; or altering the outage schedules of the Large Generating Facility and Interconnection Customer's Interconnection Facilities. Interconnection Customer shall comply with all of Reliability Coordinator's operating instructions concerning Large Generating Facility real power and reactive power output within the manufacturer's design limitations of the Large Generating Facility's equipment that is in service and physically available for operation at the time, in compliance with Applicable Laws and Regulations.

13.5.2 Reduction and Disconnection.

Reliability Coordinator may reduce Interconnection Service or disconnect the Large Generating Facility or Interconnection Customer's Interconnection Facilities, when such reduction or disconnection is necessary under Good Utility Practice due to Emergency Conditions. These rights are separate and distinct from any right of curtailment of Transmission Owner pursuant to Transmission Owner's Tariff. When Transmission Owner can schedule the reduction or disconnection in advance, Transmission Owner shall notify Interconnection Customer of the reasons, timing and expected duration of the reduction or disconnection. Transmission Owner shall coordinate with Interconnection Customer using Good Utility Practice to schedule the reduction or disconnection during periods of least impact to Interconnection Customer and Transmission Owner. Any reduction or disconnection shall continue only for so long as reasonably necessary under Good Utility Practice. The Parties shall cooperate with each other to restore the Large Generating Facility, the Interconnection Facilities, and the Transmission System to their normal operating state as soon as practicable consistent with Good Utility Practice.

13.6 Interconnection Customer Authority.

Consistent with Good Utility Practice and the LGIA and the LGIP, Interconnection Customer may take actions or inactions with regard to the Large Generating Facility or Interconnection Customer's Interconnection Facilities during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the Large Generating Facility or Interconnection Customer's Interconnection Facilities, (iii) limit or prevent damage, and (iv) expedite restoration of service. Interconnection Customer shall use Reasonable Efforts to minimize the effect of such actions or inactions on the Transmission System and Transmission Owner's Interconnection Facilities. Transmission Owner shall use Reasonable Efforts to assist Interconnection Customer in such actions.

13.7 Limited Liability.

Except as otherwise provided in Article 11.6.1 of this LGIA, neither Party shall be liable to the other for any action it takes in responding to an Emergency Condition so long as such action is made in good faith and is consistent with Good Utility Practice.

Article 14. Regulatory Requirements and Governing Law

14.1 Regulatory Requirements.

Each Party's obligations under this LGIA shall be subject to its receipt of any required approval or certificate from one or more Governmental Authorities in the form and substance satisfactory to the applying Party, or the Party making any required filings with, or providing notice to, such Governmental Authorities, and the expiration of any time period associated therewith. Each Party shall in good faith seek and use its Reasonable Efforts to obtain such other approvals. Nothing in this LGIA shall require Interconnection Customer to take any action that could result in its inability to obtain, or its loss of, status or exemption under the Federal Power Act, the Public Utility Holding Company Act of 1935, as amended, or the Public Utility Regulatory Policies Act of 1978.

14.2 Governing Law.

14.2.1 The validity, interpretation and performance of this LGIA and each of its provisions shall be governed by the laws of the state where the Point of Interconnection is located, without regard to its conflicts of law principles.

14.2.2 This LGIA is subject to all Applicable Laws and Regulations.

14.2.3 Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, rules, or regulations of a Governmental Authority.

Article 15. Notices

15.1 General.

Unless otherwise provided in this LGIA, any notice, demand or request required or permitted to be given by a Party to the other Party and any instrument required or permitted to be tendered or delivered by either Party in writing to the other shall be effective when delivered and may be so given, tendered or delivered, by recognized national courier, or by depositing the same with the United States Postal Service with postage prepaid, for delivery by certified or registered mail, addressed to the Party, or personally delivered to the Party, at the address set out in Appendix F, Addresses for Delivery of Notices and Billings.

Each Party may change the notice information in this LGIA by giving five (5) Business Days written notice prior to the effective date of the change.

15.2 Billings and Payments.

Billings and payments shall be sent to the addresses set out in Appendix F.

15.3 Alternative Forms of Notice.

Any notice or request required or permitted to be given by a Party to another and not required by this Agreement to be given in writing may be so given by telephone, facsimile or email to the telephone numbers and email addresses set out in Appendix F.

15.4 Operations and Maintenance Notice.

Each Party shall notify the other Party in writing of the identity of the person(s) that it designates as the point(s) of contact with respect to the implementation of Articles 9 and 10.

Article 16. Force Majeure

16.1 Force Majeure.

16.1.1 Economic hardship is not considered a Force Majeure event.

16.1.2 Neither Party shall be considered to be in Default with respect to any obligation hereunder, (including obligations under Article 4), other than the obligation to pay money when due, if prevented from fulfilling such obligation by Force Majeure. A Party unable to fulfill any obligation hereunder (other than an obligation to pay money when due) by reason of Force Majeure shall give notice and the full particulars of such Force Majeure to the other Party in writing or by telephone as soon as reasonably possible after the occurrence of the cause relied upon. Telephone notices given pursuant to this article shall be confirmed in writing as soon as reasonably possible and shall specifically state full particulars of the Force Majeure, the time and date when the Force Majeure occurred and when the Force Majeure is reasonably expected to cease. The Party affected shall exercise due diligence to remove such disability with reasonable dispatch, but shall not be required to accede or agree to any provision not satisfactory to it in order to settle and terminate a strike or other labor disturbance.

Article 17. Default

17.1 Default.

17.1.1 General.

No Default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of Force Majeure as defined in this LGIA or the result of an act of omission of the other Party. Upon a Breach, the non-breaching Party shall give written notice of such Breach to the breaching Party. Except as provided in Article 17.1.2, the breaching Party shall have thirty (30) Calendar Days from receipt of the Default notice within which to cure such Breach; provided however, if such Breach is not capable of cure within thirty (30) Calendar Days, the breaching Party shall commence such cure within thirty (30) Calendar Days after notice and continuously and diligently complete such cure within ninety (90) Calendar Days from receipt of the Default notice; and, if cured within such time, the Breach specified in such notice shall cease to exist.

17.1.2 Right to Terminate.

If a Breach is not cured as provided in this article, or if a Breach is not capable of being cured within the period provided for herein, the nonbreaching Party shall have the right to declare a Default and terminate this LGIA by written notice at any time

until cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates this LGIA, to recover from the breaching Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this article will survive termination of this LGIA.

Article 18. Indemnity, Consequential Damages and Insurance

18.1 Indemnity.

The Parties shall at all times indemnify, defend, and hold each other harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or inactions of its obligations under this LGIA on behalf of the Indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.

18.1.1 Indemnified Person.

If an Indemnified Person is entitled to indemnification under this Article 18 as a result of a claim by a third party, and the Indemnifying Party fails, after notice and reasonable opportunity to proceed under Article 18.1, to assume the defense of such claim, such Indemnified Person may at the expense of the Indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

18.1.2 Indemnifying Party.

If an Indemnifying Party is obligated to indemnify and hold any Indemnified Person harmless under this Article 18, the amount owing to the Indemnified Person shall be the amount of such Indemnified Person's actual Loss, net of any insurance or other recovery.

18.1.3 Indemnity Procedures.

Promptly after receipt by an Indemnified Person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in Article 18.1 may apply, the Indemnified Person shall notify the Indemnifying Party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the Indemnifying Party.

The Indemnifying Party shall have the right to assume the defense thereof with counsel designated by such Indemnifying Party and reasonably satisfactory to the Indemnified Person. If the defendants in any such action include one or more Indemnified Persons and the Indemnifying Party and if the Indemnified Person reasonably concludes that there may be legal defenses available to it and/or other Indemnified Persons which are different from or additional to those available to the Indemnifying Party, the Indemnified Person shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the Indemnifying Party shall only be required to pay the fees and expenses of one additional attorney to represent an Indemnified Person or Indemnified Persons having such differing or additional legal defenses.

The Indemnified Person shall be entitled, at its expense, to participate in any such

action, suit or proceeding, the defense of which has been assumed by the Indemnifying Party. Notwithstanding the foregoing, the Indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the Indemnified Person and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the Indemnified Person, or there exists a conflict or adversity of interest between the Indemnified Person and the Indemnifying Party, in such event the Indemnifying Party shall pay the reasonable expenses of the Indemnified Person, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the Indemnified Person, which shall not be reasonably withheld, conditioned or delayed.

18.2 Consequential Damages.

Other than the Liquidated Damages heretofore described, in no event shall any Party be liable under any provision of this LGIA for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to another Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

18.3 Insurance.

Each party shall, at its own expense, maintain in force throughout the period of this LGIA, and until released by the other Party, the following minimum insurance coverages, with insurers authorized to do business in the state where the Point of Interconnection is located:

- 18.3.1** Employers' Liability and Workers' Compensation Insurance providing statutory benefits in accordance with the laws and regulations of the state in which the Point of Interconnection is located.
- 18.3.2** Commercial General Liability Insurance including premises and operations, personal injury, broad form property damage, broad form blanket contractual liability coverage (including coverage for the contractual indemnification) products and completed operations coverage, coverage for explosion, collapse and underground hazards, independent contractors coverage, coverage for pollution to the extent normally available and punitive damages to the extent normally available and a cross liability endorsement, with minimum limits of One Million Dollars (\$1,000,000) per occurrence/One Million Dollars (\$1,000,000) aggregate combined single limit for personal injury, bodily injury, including death and property damage.
- 18.3.3** Comprehensive Automobile Liability Insurance for coverage of owned and non-owned and hired vehicles, trailers or semi-trailers designed for travel on public roads, with a minimum, combined single limit of One Million Dollars (\$1,000,000) per occurrence for bodily injury, including death, and property damage.
- 18.3.4** Excess Public Liability Insurance over and above the Employers' Liability Commercial General Liability and Comprehensive Automobile Liability Insurance coverage, with a minimum combined single limit of Twenty Million Dollars (\$20,000,000) per occurrence/Twenty Million Dollars (\$20,000,000) aggregate.
- 18.3.5** The Commercial General Liability Insurance, Comprehensive Automobile Insurance and Excess Public Liability Insurance policies shall name the other Party, its parent, associated and Affiliate companies and their respective directors, officers, agents,

servants and employees ("Other Party Group") as additional insured. All policies shall contain provisions whereby the insurers waive all rights of subrogation in accordance with the provisions of this LGIA against the Other Party Group and provide thirty (30) Calendar Days advance written notice to the Other Party Group prior to anniversary date of cancellation or any material change in coverage or condition.

- 18.3.6** The Commercial General Liability Insurance, Comprehensive Automobile Liability Insurance and Excess Public Liability Insurance policies shall contain provisions that specify that the policies are primary and shall apply to such extent without consideration for other policies separately carried and shall state that each insured is provided coverage as though a separate policy had been issued to each, except the insurer's liability shall not be increased beyond the amount for which the insurer would have been liable had only one insured been covered. Each Party shall be responsible for its respective deductibles or retentions.
- 18.3.7** The Commercial General Liability Insurance, Comprehensive Automobile Liability Insurance and Excess Public Liability Insurance policies, if written on a Claims First Made Basis, shall be maintained in full force and effect for two (2) years after termination of this LGIA, which coverage may be in the form of tail coverage or extended reporting period coverage if agreed by the Parties.
- 18.3.8** The requirements contained herein as to the types and limits of all insurance to be maintained by the Parties are not intended to and shall not in any manner, limit or qualify the liabilities and obligations assumed by the Parties under this LGIA.
- 18.3.9** Within ten (10) days following execution of this LGIA, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) days thereafter, each Party shall provide certification of all insurance required in this LGIA, executed by each insurer or by an authorized representative of each insurer.
- 18.3.10** Notwithstanding the foregoing, each Party may self-insure to meet the minimum insurance requirements of Articles 18.3.2 through 18.3.8 to the extent it maintains a self-insurance program; provided that, such Party's senior secured debt is rated at investment grade or better by Standard & Poor's and that its self-insurance program meets the minimum insurance requirements of Articles 18.3.2 through 18.3.8. For any period of time that a Party's senior secured debt is unrated by Standard & Poor's or is rated at less than investment grade by Standard & Poor's, such Party shall comply with the insurance requirements applicable to it under Articles 18.3.2 through 18.3.9. In the event that a Party is permitted to self-insure pursuant to this article, it shall notify the other Party that it meets the requirements to self-insure and that its self-insurance program meets the minimum insurance requirements in a manner consistent with that specified in Article 18.3.9.
- 18.3.11** The Parties agree to report to each other in writing as soon as practical all accidents or occurrences resulting in injuries to any person, including death, and any property damage arising out of this LGIA.

Article 19. Assignment

19.1 Assignment.

This LGIA may be assigned by a Party only with the written consent of the other Party; provided that each Party may assign this LGIA without the consent of another Party to any

Affiliate of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this LGIA; and provided further that Interconnection Customer shall have the right to assign this LGIA, without the consent of Transmission Owner, for collateral security purposes to aid in providing financing for the Large Generating Facility, provided that Interconnection Customer will promptly notify Transmission Owner of any such assignment. Any financing arrangement entered into by Interconnection Customer pursuant to this article will provide that prior to or upon the exercise of the secured party's, trustee's or mortgagee's assignment rights pursuant to said arrangement, the secured creditor, the trustee or mortgagee will notify Transmission Owner of the date and particulars of any such exercise of assignment right(s), including providing the Transmission Owner with proof that it meets the requirements of Articles 11.5 and 18.3. Any attempted assignment that violates this article is void and ineffective. Any assignment under this LGIA shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof. Where required, consent to assignment will not be unreasonably withheld, conditioned or delayed.

Article 20. Severability

20.1 Severability.

If any provision in this LGIA is finally determined to be invalid, void or unenforceable by any court or other Governmental Authority having jurisdiction, such determination shall not invalidate, void or make unenforceable any other provision, agreement or covenant of this LGIA; provided that if Interconnection Customer (or any third party, but only if such third party is not acting at the direction of Transmission Owner) seeks and obtains such a final determination with respect to any provision of the Alternate Option (Article 5.1.2), or the Negotiated Option (Article 5.1.4), then none of these provisions shall thereafter have any force or effect and the Parties' rights and obligations shall be governed solely by the Standard Option (Article 5.1.1).

Article 21. Comparability

21.1 Comparability.

The Parties will comply with all applicable comparability and code of conduct laws, rules and regulations, as amended from time to time.

Article 22. Confidentiality

22.1 Confidentiality.

Confidential Information shall include, without limitation, all information relating to a Party's technology, research and development, business affairs, and pricing, and any information supplied by either of the Parties to the other prior to the execution of this LGIA.

Information is Confidential Information only if it is clearly designated or marked in writing as confidential on the face of the document, or, if the information is conveyed orally or by inspection, if the Party providing the information orally informs the Party receiving the information that the information is confidential.

If requested by a Party, the other Party shall provide in writing, the basis for asserting that the information referred to in this Article 22 warrants confidential treatment, and the requesting Party may disclose such writing to the appropriate Governmental Authority. Each Party shall

be responsible for the costs associated with affording confidential treatment to its information.

22.1.1 Term.

During the term of this LGIA, and for a period of three (3) years after the expiration or termination of this LGIA, except as otherwise provided in this Article 22, each Party shall hold in confidence and shall not disclose to any person Confidential Information.

22.1.2 Scope.

Confidential Information shall not include information that the receiving Party can demonstrate: (1) is generally available to the public other than as a result of a disclosure by the receiving Party; (2) was in the lawful possession of the receiving Party on a non-confidential basis before receiving it from the disclosing Party; (3) was supplied to the receiving Party without restriction by a third party, who, to the knowledge of the receiving Party after due inquiry, was under no obligation to the disclosing Party to keep such information confidential; (4) was independently developed by the receiving Party without reference to Confidential Information of the disclosing Party; (5) is, or becomes, publicly known, through no wrongful act or omission of the receiving Party or Breach of this LGIA; or (6) is required, in accordance with Article 22.1.7 of the LGIA, Order of Disclosure, to be disclosed by any Governmental Authority or is otherwise required to be disclosed by law or subpoena, or is necessary in any legal proceeding establishing rights and obligations under this LGIA. Information designated as Confidential Information will no longer be deemed confidential if the Party that designated the information as confidential notifies the other Party that it no longer is confidential.

22.1.3 Release of Confidential Information.

A Party shall not release or disclose Confidential Information to any other person, except to its Affiliates (limited by the Standards of Conduct requirements), subcontractors, employees, consultants, or to parties who may be or considering providing financing to or equity participation with Interconnection Customer, or to potential purchasers or assignees of Interconnection Customer, on a need-to-know basis in connection with this LGIA, unless such person has first been advised of the confidentiality provisions of this Article 22 and has agreed to comply with such provisions. Notwithstanding the foregoing, a Party providing Confidential Information to any person shall remain primarily responsible for any release of Confidential Information in contravention of this Article 22.

22.1.4 Rights.

Each Party retains all rights, title, and interest in the Confidential Information that each Party discloses to the other Party. The disclosure by each Party to the other of Confidential Information shall not be deemed a waiver by a Party or any other person or entity of the right to protect the Confidential Information from public disclosure.

22.1.5 No Warranties.

By providing Confidential Information, neither Party makes any warranties or representations as to its accuracy or completeness. In addition, by supplying Confidential Information, a Party does not obligate itself to provide any particular information or Confidential Information to the other Party nor to enter into any further agreements or proceed with any other relationship or joint venture.

22.1.6 Standard of Care.

Each Party shall use at least the same standard of care to protect Confidential

Information it receives as it uses to protect its own Confidential Information from unauthorized disclosure, publication or dissemination. Each Party may use Confidential Information solely to fulfill its obligations to the other Party under this LGIA or its regulatory requirements.

22.1.7 Order of Disclosure.

If a court or a Government Authority or entity with the right, power, and apparent authority to do so requests or requires any Party, by subpoena, oral deposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirement(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this LGIA. Notwithstanding the absence of a protective order or waiver, the Party may disclose such Confidential Information which, in the opinion of its counsel, the Party is legally compelled to disclose. Each Party will use Reasonable Efforts to obtain reliable assurance that confidential treatment will be accorded any Confidential Information so furnished.

22.1.8 Termination of Agreement.

Upon termination of this LGIA for any reason, each Party shall, within ten (10) Calendar Days of receipt of a written request from the other Party, use Reasonable Efforts to destroy, erase, or delete (with such destruction, erasure, and deletion certified in writing to another Party) or return to the other Party, without retaining copies thereof, any and all written or electronic Confidential Information received from the other Party.

22.1.9 Remedies.

The Parties agree that monetary damages would be inadequate to compensate a Party for another Party's Breach of its obligations under this Article 22. Each Party accordingly agrees that the other Party shall be entitled to equitable relief, by way of injunction or otherwise, if the first Party Breaches or threatens to Breach its obligations under this Article 22, which equitable relief shall be granted without bond or proof of damages, and the receiving Party shall not plead in defense that there would be an adequate remedy at law. Such remedy shall not be deemed an exclusive remedy for the Breach of this Article 22, but shall be in addition to all other remedies available at law or in equity. The Parties further acknowledge and agree that the covenants contained herein are necessary for the protection of legitimate business interests and are reasonable in scope. No Party, however, shall be liable for indirect, incidental, or consequential or punitive damages of any nature or kind resulting from or arising in connection with this Article 22.

22.1.10 Disclosure to FERC, its Staff, or a State.

Notwithstanding anything in this Article 22 to the contrary, and pursuant to 18 CFR section 1b.20, if FERC or its staff, during the course of an investigation or otherwise, requests information from one of the Parties that is otherwise required to be maintained in confidence pursuant to this LGIA, the Party shall provide the requested information to FERC or its staff, within the time provided for in the request for information. In providing the information to FERC or its staff, the Party must, consistent with 18 CFR section 388.112, request that the information be treated as confidential and non-public by FERC and its staff and that the information be withheld from public disclosure. Parties are prohibited from notifying the other Party to this LGIA prior to the release of the Confidential Information to FERC or

its staff. The Party shall notify the other Party to the LGIA when it is notified by FERC or its staff that a request to release Confidential Information has been received by FERC, at which time either of the Parties may respond before such information would be made public, pursuant to 18 CFR § 388.112. Requests from a state regulatory body conducting a confidential investigation shall be treated in a similar manner if consistent with the applicable state rules and regulations.

22.1.11 Subject to the exception in Article 22.1.10, any information that a Party claims is competitively sensitive, commercial or financial information under this LGIA ("Confidential Information") shall not be disclosed by either Party to any person not employed or retained by the other Party, except to the extent disclosure is (i) required by law; (ii) reasonably deemed by the disclosing Party to be required to be disclosed in connection with a dispute between the Parties, or the defense of litigation or dispute; (iii) otherwise permitted by consent of the other Party, such consent not to be unreasonably withheld; or (iv) necessary to fulfill its obligations under this LGIA or as a transmission service provider or a Balancing Authority including disclosing the Confidential Information to an RTO or ISO or to a regional or national reliability organization. The Party asserting confidentiality shall notify the other Party in writing of the information it claims is confidential. Prior to any disclosures of the other Party's Confidential Information under this subparagraph, or if any third party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the disclosing Party agrees to promptly notify the other Party in writing and agrees to assert confidentiality and cooperate with the other Party in seeking to protect the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.

Article 23. Environmental Releases

23.1 Each Party shall notify the other Party, first orally and then in writing, of the release of any Hazardous Substances, any asbestos or lead abatement activities, or any type of remediation activities related to the Large Generating Facility or the Interconnection Facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall: (i) provide the notice as soon as practicable, provided such Party makes a good faith effort to provide the notice no later than twenty-four hours after such Party becomes aware of the occurrence; and (ii) promptly furnish to the other Party copies of any publicly available reports filed with any Governmental Authorities addressing such events.

Article 24. Information Requirements

24.1 Information Acquisition.

Transmission Owner and Interconnection Customer shall submit to each other with copies to the ITO specific information regarding the electrical characteristics of their respective facilities as described below and in accordance with Applicable Reliability Standards.

24.2 Information Submission by Transmission Owner.

The initial information submission by Transmission Owner shall occur no later than one hundred eighty (180) Calendar Days prior to Trial Operation and shall include Transmission System information necessary to allow Interconnection Customer to select equipment and meet any system protection and stability requirements, unless otherwise agreed to by the Parties. On

a monthly basis the Transmission Owner shall provide Interconnection Customer and ITO a status report on the construction and installation of Transmission Owner's Interconnection Facilities and Network Upgrades, including, but not limited to, the following information: (1) progress to date; (2) a description of the activities since the last report (3) a description of the action items for the next period; and (4) the delivery status of equipment ordered.

24.3 Updated Information Submission by Interconnection Customer.

The updated information submission by Interconnection Customer, including manufacturer information, shall occur no later than one hundred eighty (180) Calendar Days prior to the Trial Operation. Interconnection Customer shall submit a completed copy of the Large Generating Facility data requirements contained in Appendix 1 to the LGIP. It shall also include any additional information provided to ITO for the Feasibility Study and to the Transmission Owner for the Facilities Study. Information in this submission shall be the most current Large Generating Facility design or expected performance data. Information submitted for stability models shall be compatible with Transmission Owner's standard models. If there is no compatible model, Interconnection Customer will work with a consultant mutually agreed to by the Parties to develop and supply a standard model and associated information. If Interconnection Customer's data is materially different from what was originally provided to the ITO or Transmission Owner pursuant to the Interconnection Study Agreement among the ITO, Transmission Owner, and Interconnection Customer, then the ITO and/or Transmission Owner, as appropriate, will conduct appropriate studies to determine the impact on Transmission Owner's Transmission System based on the actual data submitted pursuant to this Article 24.3. The Interconnection Customer shall not begin Trial Operation until such studies are completed.

24.4 Information Supplementation.

Prior to the Operation Date, the Parties shall supplement their information submissions described above in this Article 24 with any and all "as-built" Large Generating Facility information or "as-tested" performance information that differs from the initial submissions or, alternatively, written confirmation that no such differences exist. The Interconnection Customer shall conduct tests on the Large Generating Facility as required by Good Utility Practice such as an open circuit "step voltage" test on the Large Generating Facility to verify proper operation of the Large Generating Facility's automatic voltage regulator. Unless otherwise agreed, the test conditions shall include: (1) Large Generating Facility at synchronous speed; (2) automatic voltage regulator on and in voltage control mode; and (3) a five percent change in Large Generating Facility terminal voltage initiated by a change in the voltage regulators reference voltage. Interconnection Customer shall provide validated test recordings showing the responses of Large Generating Facility terminal and field voltages. In the event that direct recordings of these voltages is impractical, recordings of other voltages or currents that mirror the response of the Large Generating Facility's terminal or field voltage are acceptable if information necessary to translate these alternate quantities to actual Large Generating Facility terminal or field voltages is provided. Large Generating Facility testing shall be conducted and results provided to Transmission Owner and ITO for each individual generating unit in a station.

Subsequent to the Operation Date, Interconnection Customer shall provide Transmission Owner and ITO any information changes due to equipment replacement, repair, or adjustment. Transmission Owner shall provide Interconnection Customer any information changes due to equipment replacement, repair or adjustment in the directly connected substation or any adjacent Transmission Owner-owned substation that may affect Interconnection Customer's

Interconnection Facilities equipment ratings, protection or operating requirements. The Parties shall provide such information no later than thirty (30) Calendar Days after the date of the equipment replacement, repair or adjustment.

Article 25. Information Access and Audit Rights

25.1 Information Access.

Each Party (the "disclosing Party") shall make available to the other Party information that is in the possession of the disclosing Party and is necessary in order for the other Party to: (i) verify the costs incurred by the disclosing Party for which the other Party is responsible under this LGIA; and (ii) carry out its obligations and responsibilities under this LGIA. The Parties shall not use such information for purposes other than those set forth in this Article 25.1 and to enforce their rights under this LGIA.

25.2 Reporting of Non-Force Majeure Events.

Each Party (the "notifying Party") shall notify the other Party when the notifying Party becomes aware of its inability to comply with the provisions of this LGIA for a reason other than a Force Majeure event. The Parties agree to cooperate with each other and provide necessary information regarding such inability to comply, including the date, duration, reason for the inability to comply, and corrective actions taken or planned to be taken with respect to such inability to comply. Notwithstanding the foregoing, notification, cooperation or information provided under this article shall not entitle the Party receiving such notification to allege a cause for anticipatory breach of this LGIA.

25.3 Audit Rights.

Subject to the requirements of confidentiality under Article 22 of this LGIA, each Party shall have the right, during normal business hours, and upon prior reasonable notice to the other Party, to audit at its own expense the other Party's accounts and records pertaining to each Party's performance or each Party's satisfaction of obligations under this LGIA. Such audit rights shall include audits of the other Party's costs, calculation of invoiced amounts, Transmission Owner's efforts to allocate responsibility for the provision of reactive support to the Transmission System, Transmission Owner's efforts to allocate responsibility for interruption or reduction of generation on the Transmission System, and each Party's actions in an Emergency Condition. Any audit authorized by this article shall be performed at the offices where such accounts and records are maintained and shall be limited to those portions of such accounts and records that relate to each Party's performance and satisfaction of obligations under this LGIA. Each Party shall keep such accounts and records for a period equivalent to the audit rights periods described in Article 25.4.

25.4 Audit Rights Periods.

25.4.1 Audit Rights Period for Construction-Related Accounts and Records.

Accounts and records related to the design, engineering, procurement, and construction of Transmission Owner's Interconnection Facilities and Network Upgrades shall be subject to audit for a period of twenty-four months following Transmission Owner's issuance of a final invoice in accordance with Article 12.2.

25.4.2 Audit Rights Period for All Other Accounts and Records.

Accounts and records related to each Party's performance or satisfaction of all obligations under this LGIA other than those described in Article 25.4.1 shall be subject to audit as follows: (i) for an audit relating to cost obligations, the applicable audit rights period shall be twenty-four months after the auditing Party's receipt of

an invoice giving rise to such cost obligations; and (ii) for an audit relating to all other obligations, the applicable audit rights period shall be twenty-four months after the event for which the audit is sought.

25.5 Audit Results.

If an audit by a Party determines that an overpayment or an underpayment has occurred, a notice of such overpayment or underpayment shall be given to the other Party together with those records from the audit which support such determination.

Article 26. Subcontractors

26.1 General.

Nothing in this LGIA shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this LGIA; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this LGIA in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

26.2 Responsibility of Principal.

The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this LGIA. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall Transmission Owner be liable for the actions or inactions of Interconnection Customer or its subcontractors with respect to obligations of Interconnection Customer under Article 5 of this LGIA. Any applicable obligation imposed by this LGIA upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

26.3 No Limitation by Insurance.

The obligations under this Article 26 will not be limited in any way by any limitation of subcontractor's insurance.

Article 27. Disputes

27.1 Submission.

In the event any Party has a dispute, or asserts a claim, that arises out of or in connection with this LGIA or its performance, such Party (the "disputing Party") shall provide the other Party with written notice of the dispute or claim ("Notice of Dispute"). Such dispute or claim shall be referred to a designated senior representative of each Party for resolution on an informal basis as promptly as practicable after receipt of the Notice of Dispute by the Party. In the event the designated representatives are unable to resolve the claim or dispute through unassisted or assisted negotiations within thirty (30) Calendar Days of the Party's receipt of the Notice of Dispute, such claim or dispute may, upon mutual agreement of the Parties, be submitted to arbitration and resolved in accordance with the arbitration procedures set forth below. In the event the Parties do not agree to submit such claim or dispute to arbitration, each Party may exercise whatever rights and remedies it may have in equity or at law consistent with the terms of this LGIA.

27.2 External Arbitration Procedures.

Any arbitration initiated under this LGIA shall be conducted before a single neutral arbitrator

appointed by the Parties. If the Parties fail to agree upon a single arbitrator within ten (10) Calendar Days of the submission of the dispute to arbitration, the Transmission Owner or the Interconnection Customer shall choose one arbitrator who shall sit on a three-member arbitration panel. The two arbitrators so chosen shall within twenty (20) Calendar Days select a third arbitrator to chair the arbitration panel. In either case, the arbitrators shall be knowledgeable in electric utility matters, including electric transmission and bulk power issues, and shall not have any current or past substantial business or financial relationships with any party to the arbitration (except prior arbitration). The arbitrator(s) shall provide each of the Parties an opportunity to be heard and, except as otherwise provided herein, shall conduct the arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association ("Arbitration Rules") and any applicable FERC regulations or RTO rules; provided, however, in the event of a conflict between the Arbitration Rules and the terms of this Article 27, the terms of this Article 27 shall prevail.

27.3 Arbitration Decisions.

Unless otherwise agreed by the Parties, the arbitrator(s) shall render a decision within ninety (90) Calendar Days of appointment and shall notify the Parties in writing of such decision and the reasons therefor. The arbitrator(s) shall be authorized only to interpret and apply the provisions of this LGIA and shall have no power to modify or change any provision of this Agreement in any manner. The decision of the arbitrator(s) shall be final and binding upon the Parties, and judgment on the award may be entered in any court having jurisdiction. The decision of the arbitrator(s) may be appealed solely on the grounds that the conduct of the arbitrator(s), or the decision itself, violated the standards set forth in the Federal Arbitration Act or the Administrative Dispute Resolution Act. The final decision of the arbitrator must also be filed with FERC if it affects jurisdictional rates, terms and conditions of service, Interconnection Facilities, or Network Upgrades.

27.4 Costs.

Each Party shall be responsible for its own costs incurred during the arbitration process and for the following costs, if applicable: (1) the cost of the arbitrator chosen by the Party to sit on the three member panel and one half of the cost of the third arbitrator chosen; or (2) one half the cost of the single arbitrator jointly chosen by the Parties.

Article 28. Representations, Warranties, and Covenants

28.1 General.

Each Party makes the following representations, warranties and covenants:

28.1.1 Good Standing.

Such Party is duly organized, validly existing and in good standing under the laws of the state in which it is organized, formed, or incorporated, as applicable; that it is qualified to do business in the state or states in which the Large Generating Facility, Interconnection Facilities and Network Upgrades owned by such Party, as applicable, are located; and that it has the corporate power and authority to own its properties, to carry on its business as now being conducted and to enter into this LGIA and carry out the transactions contemplated hereby and perform and carry out all covenants and obligations on its part to be performed under and pursuant to this LGIA.

28.1.2 Authority.

Such Party has the right, power and authority to enter into this LGIA, to become a

Party hereto and to perform its obligations hereunder. This LGIA is a legal, valid and binding obligation of such Party, enforceable against such Party in accordance with its terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization or other similar laws affecting creditors' rights generally and by general equitable principles (regardless of whether enforceability is sought in a proceeding in equity or at law).

28.1.3 No Conflict.

The execution, delivery and performance of this LGIA does not violate or conflict with the organizational or formation documents, or bylaws or operating agreement, of such Party, or any judgment, license, permit, order, material agreement or instrument applicable to or binding upon such Party or any of its assets.

28.1.4 Consent and Approval.

Such Party has sought or obtained, or, in accordance with this LGIA will seek or obtain, each consent, approval, authorization, order, or acceptance by any Governmental Authority in connection with the execution, delivery and performance of this LGIA, and it will provide to any Governmental Authority notice of any actions under this LGIA that are required by Applicable Laws and Regulations.

Article 29. Joint Operating Committee

29.1 Joint Operating Committee.

Transmission Owner and Interconnection Customer shall constitute a Joint Operating Committee to coordinate operating and technical considerations of Interconnection Service. At least six (6) months prior to the expected Initial Synchronization Date, Interconnection Customer and Transmission Owner shall each appoint one representative and one alternate to the Joint Operating Committee. Each Interconnection Customer shall notify Transmission Owner of its appointment in writing. Such appointments may be changed at any time by similar notice. The Joint Operating Committee shall meet as necessary, but not less than once each calendar year, to carry out the duties set forth herein. The Joint Operating Committee shall hold a meeting at the request of each Party, at a time and place agreed upon by the representatives. The Joint Operating Committee shall perform all of its duties consistent with the provisions of this LGIA. Each Party shall cooperate in providing to the Joint Operating Committee all information required in the performance of the Joint Operating Committee's duties. All decisions and agreements, if any, made by the Joint Operating Committee, shall be evidenced in writing. The duties of the Joint Operating Committee shall include the following:

29.1.1 Establish data requirements and operating record requirements.

29.1.2 Review the requirements, standards, and procedures for data acquisition equipment, protective equipment, and any other equipment or software.

29.1.3 Annually review the one (1) year forecast of maintenance and planned outage schedules of Transmission Owner's and Interconnection Customer's facilities at the Point of Interconnection.

29.1.4 Coordinate the scheduling of maintenance and planned outages on the Interconnection Facilities, the Large Generating Facility and other facilities that impact the normal operation of the interconnection of the Large Generating Facility to the Transmission System.

29.1.5 Ensure that information is being provided by each Party regarding equipment availability.

29.1.6 Perform such other duties as may be conferred upon it by mutual agreement of the Parties.

Article 30. Miscellaneous

30.1 Binding Effect.

This LGIA and the rights and obligations hereof, shall be binding upon and shall inure to the benefit of the successors and assigns of the Parties hereto.

30.2 Conflicts.

In the event of a conflict between the body of this LGIA and any attachment, appendices or exhibits hereto, the terms and provisions of the body of this LGIA shall prevail and be deemed the final intent of the Parties.

30.3 Rules of Interpretation.

This LGIA, unless a clear contrary intention appears, shall be construed and interpreted as follows: (1) the singular number includes the plural number and vice versa; (2) reference to any person includes such person's successors and assigns but, in the case of a Party, only if such successors and assigns are permitted by this LGIA, and reference to a person in a particular capacity excludes such person in any other capacity or individually; (3) reference to any agreement (including this LGIA), document, instrument or tariff means such agreement, document, instrument, or tariff as amended or modified and in effect from time to time in accordance with the terms thereof and, if applicable, the terms hereof; (4) reference to any Applicable Laws and Regulations means such Applicable Laws and Regulations as amended, modified, codified, or reenacted, in whole or in part, and in effect from time to time, including, if applicable, rules and regulations promulgated thereunder; (5) unless expressly stated otherwise, reference to any Article, Section or Appendix means such Article of this LGIA or such Appendix to this LGIA, or such Section to the LGIP or such Appendix to the LGIP, as the case may be; (6) "hereunder", "hereof", "herein", "hereto" and words of similar import shall be deemed references to this LGIA as a whole and not to any particular Article or other provision hereof or thereof; (7) "including" (and with correlative meaning "include") means including without limiting the generality of any description preceding such term; and (8) relative to the determination of any period of time, "from" means "from and including", "to" means "to but excluding" and "through" means "through and including".

30.4 Entire Agreement.

This LGIA, including all Appendices and Schedules attached hereto, constitutes the entire agreement between the Parties with reference to the subject matter hereof, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this LGIA. There are no other agreements, representations, warranties, or covenants which constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under this LGIA.

30.5 No Third Party Beneficiaries.

This LGIA is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

30.6 Waiver.

The failure of a Party to this LGIA to insist, on any occasion, upon strict performance of any provision of this LGIA will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

Any waiver at any time by either Party of its rights with respect to this LGIA shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this LGIA. Termination or Default of this LGIA for any reason by Interconnection Customer shall not constitute a waiver of Interconnection Customer's legal rights to obtain an interconnection from Transmission Owner. Any waiver of this LGIA shall, if requested, be provided in writing.

30.7 Headings.

The descriptive headings of the various Articles of this LGIA have been inserted for convenience of reference only and are of no significance in the interpretation or construction of this LGIA.

30.8 Multiple Counterparts.

This LGIA may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

30.9 Amendment.

The Parties may by mutual agreement amend this LGIA by a written instrument duly executed by the Parties.

30.10 Modification by the Parties.

The Parties may by mutual agreement amend the Appendices to this LGIA by a written instrument duly executed by the Parties. Such amendment shall become effective and a part of this LGIA upon satisfaction of all Applicable Laws and Regulations.

30.11 Reservation of Rights.

Transmission Owner shall have the right to make a unilateral filing with FERC to modify this LGIA with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation under section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder, and Interconnection Customer shall have the right to make a unilateral filing with FERC to modify this LGIA pursuant to section 206 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by any other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this LGIA shall limit the rights of the Parties or of FERC under sections 205 or 206 of the Federal Power Act and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

30.12 No Partnership.

This LGIA shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. A Party shall not have a right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

IN WITNESS WHEREOF, the Parties have executed this LGIA in duplicate originals, each of which shall constitute and be an original effective Agreement between the Parties.

Louisville Gas & Electric and Kentucky Utilities Company

By: Brett McFarland

kac

Title: VP - Transmission

Date: 11-17-2020

Interconnection Customer

By: Juergen Fehr

Title: Manager

Date: Nov 17, 2020

APPENDICES TO LGIA

Appendix A	Interconnection Facilities, Network Upgrades, Distribution Upgrades
Appendix B	Milestones
Appendix C	Interconnection Details
Appendix D	Security Arrangements Details
Appendix E	Commercial Operation Date
Appendix F	Addresses for Delivery of Notices and Billings
Appendix G	Interconnection Requirements for a Wind Generating Plant
Appendix H	Civil Specification
Appendix I	Facilities Study Report

Appendix A to LGIA Interconnection Facilities, Network Upgrades and Distribution Upgrades

Interconnection Customer's Generating Facility located in Ballard County, Kentucky consists of a solar photovoltaic (PV), inverter-based array, with a nominal net capacity of 104MWac at the Point of Interconnection.

In accordance with the provisions of Article 4.1.2, Interconnection Customer has selected Network Resource Interconnection Service (NRIS). The Parties acknowledge that for NRIS to be provided for 104 MW, all of the facilities set forth below must be constructed and placed into operation prior to the initial synchronization of the Generating Facility to the transmission system. Furthermore, if the Agreement is suspended by the Interconnection Customer for any reason (e. g., Article 5.16), additional Interconnection Studies and/or an amendment to the Agreement may be required.

The cost estimates provided below are based on a three (3) breaker ring bus interconnection configuration into the existing LG&E/KU owned Grahamville to Wickcliffe 161kV line as shown in Exhibit 1 in Appendix C and the following assumptions. The total project cost is estimated to be within +/- 20% accuracy in the completed Facility Study report and is based on a projected In-Service Date of June 1, 2023. Change of In-Service Date may require recalculation of the estimated cost based on updated material, labor, and burden cost.

- No costs are included in this estimate for the following (which are obligations and cost responsibilities of the Interconnection Customer):
 - Land or easement purchase

- Clearing, grading, erosion control, or any environmental requirements
- Permitting
- Substation access road
- Substation perimeter fencing to LG&E/KU specifications
- Construction of generator lead line from the generator location to the Point of Change of Ownership at the interconnection station (new or existing)
- A portion of the costs account for utility burden rates which vary over time.

Interconnection Customer shall provide site acceptable to LG&E/KU for the new interconnection substation with all ingress/egress rights. Substation location, excavation, grading, erosion control, and access to be provided by the Interconnection Customer in accordance with LG&E/KU Civil Specifications guidelines, which are included in Appendix H. The Interconnection Customer shall purchase the substation property for the interconnection substation and transfer ownership or deed the property over to LG&E/KU, or shall make and provide such other suitable arrangement such as a permanent easement meeting the specifications and requirements of LG&E/KU.

The engineering, design, and construction of the interconnection facilities and network upgrades is estimated to take twenty-four (24) months from receipt of the Interconnection Customer's notice to proceed and payment of the applicable security and deposits. This estimated timeline assumes the Interconnection Customer will provide the Preliminary Requirements as outlined in Appendix H of this LGIA within three (3) months of receipt of Customer's notice to proceed, and will provide a build-ready site in accordance with Appendix H of this LGIA within twelve (12) months of Interconnection Customer's notice to proceed. Additionally, this estimate assumes that the project schedule would not be impacted by storm damage and restoration, time of year limitations, permitting issues, outage scheduling, system emergencies, and contractor and equipment availability, or other unforeseen circumstances. In particular, outage scheduling on the 161kV interconnection line will require additional coordination, that could impact the 24 month timeframe.

The Point of Interconnection shall be the point where the Transmission Owner's Interconnection Facilities connect to the 161kV bus at the new switching station as shown on Exhibit 2 of Appendix C.

The metering point shall be at the Point of Interconnection as shown on Exhibit 2 of Appendix C.

Customer must work with the TO to provide relay settings as identified in the SIS and Facility Study (see table 2-2-A in the Facility Study report). Interconnection to LG&E/KU system is also contingent on steady state, short circuit and dynamic model, assumptions and settings used in the SIS and facilities study.

1. Interconnection Facilities:

(a) Interconnection Customer's Interconnection Facilities:

The Interconnection Customer's Interconnection Facilities are those on the Interconnection Customer's side of the Point of Change of Ownership (as shown in Exhibit 1 of Appendix C) which shall be at the point where Generating Facility or and its intermediate equipment connect to the Generating Facility's side of the motor operated disconnect switches located just prior to 161kv metering equipment. The Interconnection Customer is responsible for building, owning, and maintaining these assets.

The new interconnection facility will be constructed adjacent to the IC's collector substation.

The IC will be responsible for the design, construction, and permitting of the 161kV transmission line from their facilities to the Point of Change of Ownership (PCO) at the GI-2019-002 Solar Station including any and all cost required to maintain adequate clearances to other LG&E/KU lines and equipment along the path of the customer owned line up to the PCO.

Interconnection Customer will provide two fiber optic circuits (one for relay coordination and one for data exchange) from the generating facility to the Transmission Owners control house.

Interconnection Customer will provide “as built” drawings and information and documents about its Interconnection Facilities which shall include, but not be limited to:

- Single line relaying and metering;
- Three line diagram;
- Communication schematics;
- DC Schematics;
- Cable schedule;
- Conduit/cable trench plan and details;
- Conduit schedule;
- Site survey;
- Geotechnical studies;
- Grounding plan and details;
- General arrangement and section views;
- Schematic of the PV/Inverter system;
- Inverter data/settings describing its output response (Current/Voltage); and
- GSU data sufficient to model positive and zero sequence impedance.

All specifications provided above shall be deemed confidential.

(b) Transmission Owner’s Interconnection Facilities:

The Transmission Owner’s Interconnection Facilities are those facilities located between the Point of Change of Ownership and the Point of Interconnection (as shown in Exhibit 1 of Appendix C). The Transmission Owner’s Interconnection Facilities will be designed to adequately support 104 MW of NRIS for the Generating Facility. The Transmission Owner is responsible for building, owning, and maintaining these assets. The Interconnection Customer bears the non-refundable expense for these assets. The non-binding cost estimate for the Transmission Owner’s Interconnection Facilities is shown in table 1 and is based on and subject to the assumptions and comments in the FS-LGE-GIS-2019-002 Facilities Study Report dated May 29, 2020. The non-binding cost estimate for the Transmission Owner’s Interconnection Facilities includes the following:

High Voltage

- One (1) 161kV Motor-Operated Disconnect Switch
- Three (3) 161kV Surge Arresters
- Three (3) 161kV Metering PTs

- Three (3) 161kV Metering CTs

Civil/Structural

- One (1) Steel A-Frame structure
- Six (6) 1-Phase CCVT Supports

Protection & Control

- One (1) New Control House Space Allocation consisting of below relay panels:
- line protection panel for GI Interconnect
- metering panel for GI
- RTU panel
- AC/DC systems

Table 1

Transmission Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$287,730
Contract Labor	\$47,760
Contracted Materials	\$568,006
Company Materials	\$0
Contingency	\$90,350
Total	\$993,846

The Interconnection Customer will provide security that meets the requirements specified in Section 11.5 in a form acceptable to LG&E/KU. The Interconnection Customer will reimburse LG&E/KU for all actual costs incurred within thirty (30) days of receiving the invoice for actual costs. Transmission Owner will use commercially reasonable efforts to keep costs from exceeding the cost estimate.

Transmission Owner will provide “as built” drawings and information and documents about its Interconnection Facilities which shall include, but not be limited to:

- System Protection Facilities;
- Communication scheme / configuration;
- Metering scheme / configuration;
- Grounding scheme / configuration;
- Transmission Line and Substation Connection configurations; and
- Equipment ratings.

All specifications provided above shall be deemed confidential.

2. Network Upgrades:

(a) Stand Alone Network Upgrades:

None

(b) Other Network Upgrades:

The Network Upgrades are the additions, modifications, and upgrades to the Transmission Owner's Transmission System required at or beyond the Point of Interconnection to accommodate the interconnection with the Transmission Owner's Transmission System (as shown in Exhibit 1 of Appendix C). The Transmission Owner is responsible for building, owning, and maintaining these assets. The Interconnection Customer will provide security that meets the requirements specified in Section 11.5 in a form acceptable to LG&E/KU. The non-binding cost estimate for the Transmission Owner's Interconnection Facilities is shown in table 2 and is based on and subject to the assumptions and comments in the FS-LGE-GIS-2019-002 Facilities Study Report dated May 29, 2020. The non-binding cost estimate for the Network Upgrades includes the following:

The new network interconnection facility will be a three breaker ring bus arrangement with three 161kV lines (Grahamville, Wickcliffe, & GI Interconnect and the following equipment

High Voltage

- Three (3) 161kV Circuit Breakers
- Six (6) 161kV Manually Operated Disconnect Switches
- Six (6) 161kV Surge Arresters
- Six (6) 161kV CCVTs
- Two (2) 161kV SSVTs

Civil/Structural

- Two (2) Steel H-Frame structures
- Five (5) 3-Phase High Bus Supports
- Twelve (12) 1-Phase Low Bus Supports
- Six (6) Switch Support Stands
- Six (6) 1-Phase CCVT Supports
- Two (2) SSVT Supports
- One (1) Lightning Mast

Protection & Control

- One (1) Small (14' x 42') control house consisting of the following relay panels:
- (2) line protection panels for Grahamville & Wickcliffe & GI Interconnect
- (2) Digital communications paths, (1) associated with the Grahamville line and (1) associated with the Wickcliffe line
- (1) RTU panel
- (1) DFR panel
- AC/DC systems
- One (1) line protection replacement panel at Wickcliffe

Transmission Lines

- Four (4) 161kV three (3) pole steel dead end structures and foundations
- Hardware and Conductor for taps from existing 161kV line to the station structure
- Estimate assumes that the substation will be offset to one side of the existing 161 kV transmission line, located within 200 feet of the existing right of way, and will allow the transmission line structures to be guyed steel poles.

Telecommunication Facilities

- One (1) 195' tall Microwave tower and foundations
- Antennae systems
- MW Radio HS Terminal
- Digital Multiplex Systems and Channels
- DC Power

Table 2
Network Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$3,995,967
Contract Labor	\$937,195
Contracted Materials	\$3,195,551
Company Materials	\$781,575
Contingency	\$891,029
Total	\$9,801,317

The Interconnection Customer will provide security that meets the requirements specified in Section 11.5 in a form acceptable to LG&E/KU. Transmission Owner will use commercially reasonable efforts to keep costs from exceeding the cost estimate.

3. Distribution Upgrades:

None

4. Contingent Facilities

Other than as listed above, there are no contingent facilities that are needed to provide Interconnection Service.

5. Affected Systems

No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request.

Appendix B to LGIA Milestones

The Transmission Owner shall use the Standard Option under Article 5.1.1 (Standard Option) to design, procure and construct Transmission Owner's Interconnection Facilities and Network Upgrades. Transmission Owner is not responsible for construction, performance of work, or for making any arrangements with any third parties, related to any facilities that are the Interconnection Customer's responsibility (e.g., Interconnection Customer's Interconnection Facilities and facilities owned by third party parties such as Affected Systems); provided, however, that the Transmission Owner shall coordinate with Affected Systems as required by FERC policy.

Originally Requested Commercial Operation Date: June 1, 2022
Critical milestones and responsibility as agreed to by the Parties:

Item No.	Milestone Description	Responsible Party	Date*	LGIP/LGIA Reference
1	Provide signed certificate of insurance	Interconnection Customer and Transmission Owner	Within ten (10) days following execution of this LGIA, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) days thereafter	§ 18.3.9 of LGIA
2	Provide evidence of continued Site Control to Transmission Owner, or \$250,000 non-refundable deposit to Transmission Owner.	Interconnection Customer	Within 15 Business Days of final LGIA receipt	§ 11.3 of LGIP
3	Provide evidence to Transmission Owner that one or more of the following milestones in development of the Large Generating Facility has been achieved: (i) the execution of a contract for the supply or transportation of fuel to the Large Generating Facility; (ii) the execution of a contract for the supply of cooling water to the Large Generating Facility; (iii) execution of a contract for the	Interconnection Customer	Within 15 Business Days of final LGIA receipt	§ 11.3 of LGIP

	engineering for, procurement of major equipment for, the Large Generating Facility; (iv) execution of a contract for the sale of electric energy or capacity from the Large Generating Facility; or (v) application for an air, water, or land use permit.			
4	Provide written authorization to Transmission Owner to proceed with design, equipment procurement and construction of Transmission Interconnection Facilities	Interconnection Customer	As may be agreed to by the Parties.	§ 5.5.1 and § 5.6.3 of LGIA
5	Provision of Security to Transmission Owner pursuant to Section 11.5 of LGIA for Transmission Owner's Interconnection Facilities listed in Table 1 of Appendix A.	Interconnection Customer	At least 30 Calendar Days prior to design, procurement, construction, or the provision of Notice to Proceed in the event of a suspension.	§§ 5.5.2 and 5.6.4 of LGIA
6	Provision of security for cost consequences of tax liabilities, and reimbursement of Transmission Owner's costs pursuant to Section 5.17 <i>et seq.</i> of LGIA	Interconnection Customer	Within 30 Calendar Days of receiving notice of amount due and how amount was calculated	§ 5.17.3 of LGIA
7	Provide initial design and specification for Interconnection Customer's Interconnection Facilities to Transmission Owner	Interconnection Customer	180 Calendar Days prior to Initial Synchronization Date	§ 5.10.1 of LGIA
8	Provide final design and specification for Interconnection Customer's Interconnection Facilities to Transmission Owner	Interconnection Customer	90 Calendar Days prior to Initial Synchronization Date	§ 5.10.1 of LGIA
9	Deliver to Transmission Owner "as-built" drawings, information, and documents regarding Interconnection Customer's Interconnection Facilities	Interconnection Customer	Within 120 Calendar Days of Commercial Operation Date	§ 5.10.3 of LGIA
10	Commencement of Construction Interconnection Facilities	Transmission Owner	As may be agreed to by the Parties	§ 5.6 of LGIA
11	Deliver to Interconnection Customer "as-built" drawings, information, and documents regarding Transmission Owner's Interconnection Facilities	Transmission Owner	Within 120 Calendar Days after Commercial Operation Date	§ 5.11 of LGIA
12	Provide Interconnection Customer final cost	Transmission	Within 6 months	§ 12.2 of LGIA

	invoices	Owner	after completion	
13	Refund any excess payment over the actual cost of construction to Interconnection Customer	Transmission Owner	Within 30 Calendar Days of the issuance of the final construction invoice	§ 12.2 of LGIA
14	Submit information regarding the electrical characteristics of facilities, including Transmission System Information necessary to allow Interconnection Customer to select equipment and meet any system protection and stability requirements to Interconnection Customer	Transmission Owner	At least 180 Calendar Days prior to Trial Operation	§ 24.2 of LGIA
15	Provide Interconnection Customer and ITO with a status report on the construction and installation of Transmission Owner's Interconnection Facilities and Network Upgrades, including, but not limited to, the following: (1) progress to date; (2) a description of the activities since the last report; (3) a description of the action items for the next period; and (4) the delivery status of equipment ordered.	Transmission Owner	On a monthly basis	§ 24.2 of LGIA
16	Provide the Transmission Owner and ITO updated information, including manufacturer information, an updated copy of the Large Generating Facility data requirements contained in Appendix 1 to the LGIP, and any addition information provided to the ITO for the Feasibility Study and to the Transmission Owner for the Facilities Study.	Interconnection Customer	At least 180 Calendar Days prior to Trial Operation	§ 24.3 of LGIA
17	Provide relevant information about equipment replacement, repair, or adjustment	Interconnection Customer, Transmission Owner	Within 30 Calendar Days after the date of equipment replacement, repair, or adjustment	§ 24.4 of LGIA
18	Parties to each appoint one representative and one alternate to the Joint Operating Committee and notify the other party in writing of its selection	Interconnection Customer, Transmission Owner	At least 6 months prior to expected Initial Synchronization Date	§ 29.1 of LGIA
19	Pre-energization meeting	Interconnection Customer,	As may be agreed by the parties.	

		Transmission Owner		
20	Initial Synchronization Date	Interconnection Customer	TBD. Expected to occur the later of 24 months after receipt of security and applicable deposits, the Execution Date of the LGIA, or a written notice to proceed in the event Interconnection Customer requests a suspension under the terms of this LGIA.	
21	Commercial Operation Date	Interconnection Customer	TBD. Expected to occur the later of 24 months after receipt of security and applicable deposits, the Execution Date of the LGIA, or a written notice to proceed in the event Interconnection Customer requests a suspension under the terms of this LGIA.	

* The Interconnection Customer has expressed intent to exercise its suspension rights in accordance with Section 5.16 Suspension upon execution of this Agreement. If Interconnection Customer elects to suspend, the Milestones set forth in this Appendix B that are subject to suspension shall be adjusted and the Milestone schedule will be updated and shall reflect the fact that engineering, design, and construction of the interconnection facilities and network upgrades is estimated to take 24 months from receipt of any applicable notice to proceed and payment of the applicable security and deposits.

For the avoidance of doubt, the originally requested Commercial Operation Date was June 1, 2022. The Large Generator Interconnection Procedures (LGIP) Article 4.4.5 states, *“Extensions of less than three (3) cumulative years in the Commercial Operation Date of the Large Generating Facility to which the Generator Interconnection Request relates are not material and should be handled through construction sequencing, to the extent practicable.”* The Customer requested an extension in the Commercial Operation Date of one (1) year via the Facilities Study Agreement; which, in accordance with LG&E/KU’s OATT, does not constitute a Material Modification. In order to meet the agreed upon updated Commercial Operation Date of June 1, 2023, the Customer would need to provide notice to proceed and provide appropriate security to the TO no later than June 1, 2021 in order to allow for twenty-four (24) months of

construction. If Customer expects Suspension to extend beyond June 1, 2023, the Customer shall have contacted the ITO and received confirmation that the newly anticipated Commercial Operation Date does not constitute a material modification.

Agreed to by:

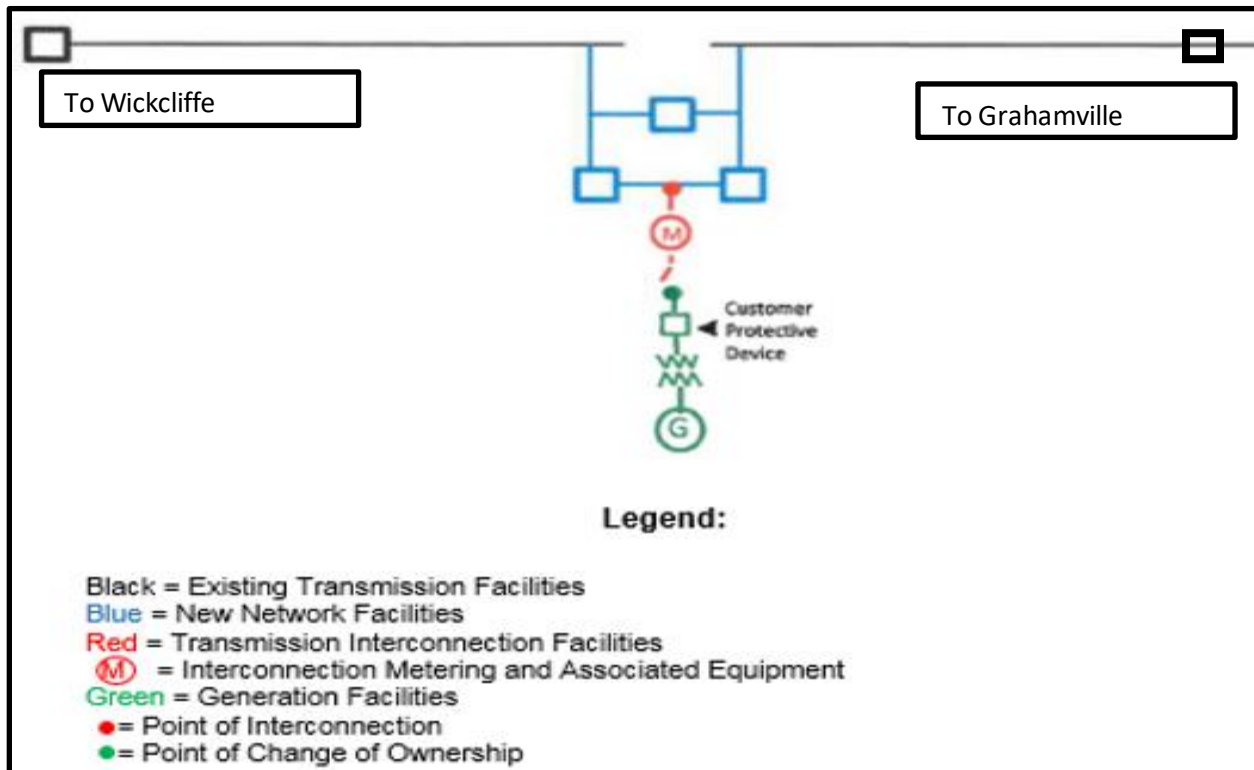
For the Transmission Owner Beth McFall Date 11-18-20 kac

For the Interconnection Customer Juergen Fehr Date Nov 17, 2020

**Appendix C to LGIA
Interconnection Details for LGI-GIS-2019-002**

This request seeks to interconnect a 104MWac Solar generating facility to the existing LG&E/KU Grahamville to Wickcliffe 161kV line via a new three breaker ring bus switching station. The proposed facility is a ground-mounted solar photovoltaic array generating facility. The solar array will be installed on the agricultural acreage with solar panels connected in series producing DC power. The DC power will be collected through a collection system and will be inverted to AC through multiple central inverters (as can be seen in the single-line diagram). The output of the inverters will be collected to a central point of interconnection where the AC voltage will be stepped up to the line voltage of 161 kV. The system will have all of the necessary safety protections and operating capabilities necessary for a safe interconnection that does not compromise grid stability.

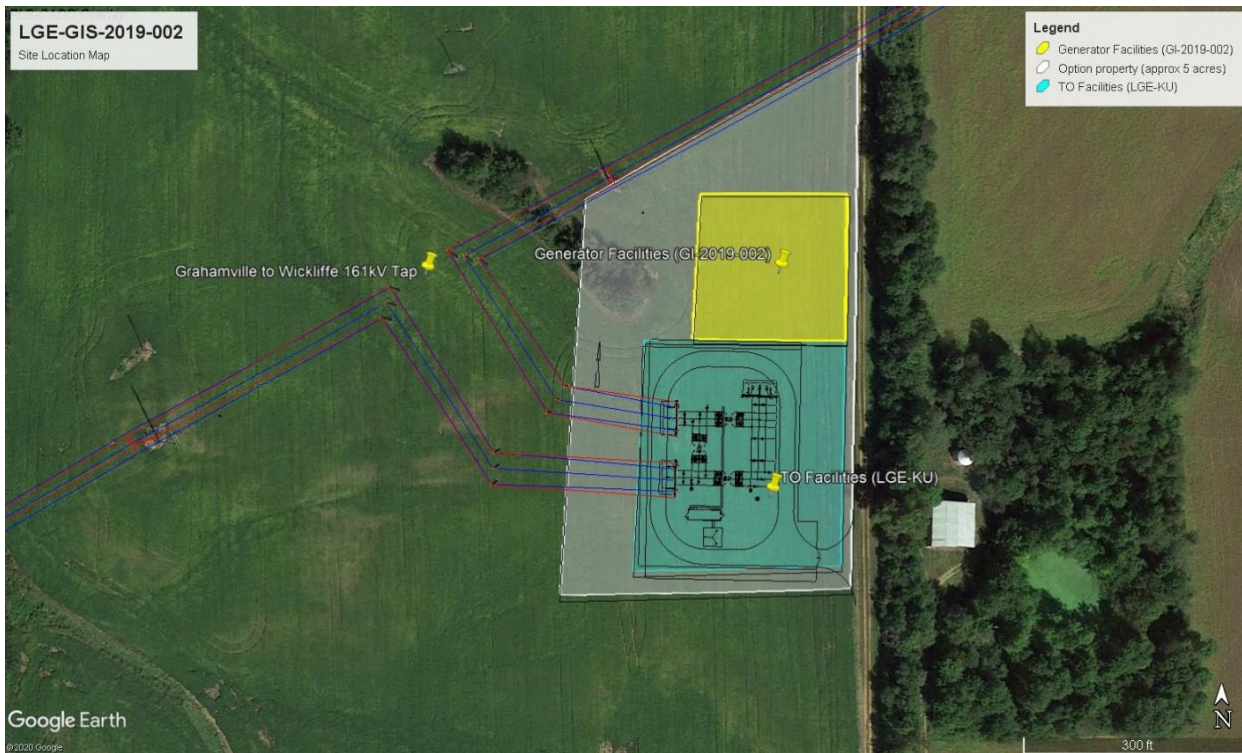
Exhibit 1



Any upgrades required beyond the Points of Interconnection would be considered Network Upgrades

Exhibit 2 shows the high level overview and location of the proposed new 161 kV switching station on the Grahamville to Wickcliffe 161kV line. The representation in Exhibit 2 is conceptual and not to scale. The final layout/orientation will be determined during detailed design.

Exhibit 2



Additional Details:

LGIA, Section 8.4: No information is required at this time. The Parties agree that if it is determined in the future that additional information is necessary for reliable transmission operations, the Parties agree to coordinate such information exchange.

Transmission Owner agrees to allow for the injection of test energy on or around the Initial Synchronization Date, as feasible. Interconnection Customer shall arrange for any necessary transmission service to accommodate the injection of test energy in accordance with the Tariff. Nothing herein obligates the Transmission Owner to purchase test energy.

The customer must work with the TO to determine mutually agreeable relay settings as identified in the Facilities Study report in Tables 2-2-A and 2-2-B.

Appendix D to LGIA Security Arrangements Details

Infrastructure security of Transmission System equipment and operations and control hardware and software is essential to ensure day-to-day Transmission System reliability and operational security. FERC will expect all public utilities, market participants, and Interconnection Customers interconnected to the Transmission System to comply with the recommendations offered by the President's Critical Infrastructure Protection Board and, eventually, best practice recommendations from the electric reliability authority. All public utilities will be expected to meet basic standards for system infrastructure and operational security, including physical, operational, and cyber-security practices.

**Appendix E to LGIA
Commercial Operation Date**

This Appendix E is a part of the LGIA between Transmission Owner and Interconnection Customer.

[Date]

[Transmission Owner address]

Re: _____ Large Generating Facility

Dear _____:

On **[Date]** **[Interconnection Customer]** has completed Trial Operation of Unit No. ____.
This letter confirms that **[Interconnection Customer]** commenced Commercial Operation of Unit No. ____ at
the Large Generating Facility, effective as of **[Date plus one day]**.

Thank you.

[Signature]

[Interconnection Customer Representative]

**Appendix F to LGIA
Addresses for Delivery of Notices and Billings Notices:**

Notices:

ITO:

TranServ International
General Counsel
3660 Technology Drive NE
Minneapolis, MN 55418

Transmission Owner:

Ashley Vinson
220 W. Main Street
Louisville, KY 40202

Interconnection Customer:

Song Sparrow Solar LLC
7804-C Fairview Rd #257
Charlotte, NC 28226

Billings and Payments:

Transmission Owner:

Ashley Vinson
220 W. Main Street
Louisville, KY 40202

Interconnection Customer:

Song Sparrow Solar LLC
7804-C Fairview Rd #257
Charlotte, NC 28226

Alternative Forms of Delivery of Notices (telephone, facsimile or email):

ITO:

TranServ International

General Counsel

Transmission Owner:

Ashley Vinson

ashley.vinson@lge-ku.com

502-627-3278

Interconnection Customer:

Song Sparrow Solar LLC
7804-C Fairview Rd #257
Charlotte, NC 28226

Appendix G to LGIA
Interconnection Requirements for a Wind Generating Plant

Appendix G sets forth requirements and provisions specific to a wind generating plant. All other requirements of this LGIA continue to apply to wind generating plant interconnections.

A. Technical Standards Applicable to a Wind Generating Plant

i. Low Voltage Ride-Through (LVRT) Capability

A wind generating plant shall be able to remain online during voltage disturbances up to the time periods and associated voltage levels set forth in the standard below. The LVRT standard provides for a transition period standard and a post-transition period standard.

Transition Period LVRT Standard

The transition period standard applies to wind generating plants subject to FERC Order 661 that have either: (i) interconnection agreements signed and filed with the Commission, filed with the Commission in unexecuted form, or filed with the Commission as non-conforming agreements between January 1, 2006 and December 31, 2006, with a scheduled in-service date no later than December 31, 2007, or (ii) wind generating turbines subject to a wind turbine procurement contract executed prior to December 31, 2005, for delivery through 2007.

1. Wind generating plants are required to remain in-service during three-phase faults with normal clearing (which is a time period of approximately 4 - 9 cycles) and single line to ground faults with delayed clearing, and subsequent post-fault voltage recovery to prefault voltage unless clearing the fault effectively disconnects the generator from the system. The clearing time requirement for a three-phase fault will be specific to the wind generating plant substation location, as determined by and documented by the Transmission Owner. The maximum clearing time the wind generating plant shall be required to withstand for a three-phase fault shall be 9 cycles at a voltage as low as 0.15 p.u., as measured at the high side of the wind generating plant step-up transformer (i.e. the transformer that steps the voltage up to the transmission interconnection voltage or “GSU”), after which, if the fault remains following the

location-specific normal clearing time for three-phase faults, the wind generating plant may disconnect from the transmission system.

2. This requirement does not apply to faults that would occur between the wind generator terminals and the high side of the GSU or to faults that would result in a voltage lower than 0.15 per unit on the high side of the GSU serving the facility.
3. Wind generating plants may be tripped after the fault period if this action is intended as part of a special protection system.
4. Wind generating plants may meet the LVRT requirements of this standard by the performance of the generators or by installing additional equipment (e.g., Static VAr Compensator, etc.) within the wind generating plant or by a combination of generator performance and additional equipment.
5. Existing individual generator units that are, or have been, interconnected to the network at the same location at the effective date of the Appendix G LVRT Standard are exempt from meeting the Appendix G LVRT Standard for the remaining life of the existing generation equipment. Existing individual generator units that are replaced are required to meet the Appendix G LVRT Standard.

Post-transition Period LVRT Standard

All wind generating plants subject to FERC Order No. 661 and not covered by the transition period described above must meet the following requirements:

1. Wind generating plants are required to remain in-service during three-phase faults with normal clearing (which is a time period of approximately 4 - 9 cycles) and single line to ground faults with delayed clearing, and subsequent post-fault voltage recovery to prefault voltage unless clearing the fault effectively disconnects the generator from the system. The clearing time requirement for a three-phase fault will be specific to the wind generating plant substation location, as determined by and documented by the Transmission Owner. The maximum clearing time the wind generating plant shall be required to withstand for a three-phase fault shall be 9 cycles after which, if the fault remains

following the location-specific normal clearing time for three-phase faults, the wind generating plant may disconnect from the transmission system. A wind generating plant shall remain interconnected during such a fault on the transmission system for a voltage level as low as zero volts, as measured at the high voltage side of the wind GSU.

2. This requirement does not apply to faults that would occur between the wind generator terminals and the high side of the GSU.
3. Wind generating plants may be tripped after the fault period if this action is intended as part of a special protection system.
4. Wind generating plants may meet the LVRT requirements of this standard by the performance of the generators or by installing additional equipment (e.g., Static VAr Compensator) within the wind generating plant or by a combination of generator performance and additional equipment.
5. Existing individual generator units that are, or have been, interconnected to the network at the same location at the effective date of the Appendix G LVRT Standard are exempt from meeting the Appendix G LVRT Standard for the remaining life of the existing generation equipment. Existing individual generator units that are replaced are required to meet the Appendix G LVRT Standard.

ii. Power Factor Design Criteria (Reactive Power)

The following reactive power requirements apply only to a newly interconnecting wind generating plant that has executed a Facilities Study Agreement as of the effective date of the Final Rule establishing the reactive power requirements for non-synchronous generators in section 9.6.1 of this LGIA (Order No. 827). A wind generating plant to which this provision applies shall maintain a power factor within the range of 0.95 leading to 0.95 lagging, measured at the Point of Interconnection as defined in this LGIA, if the ITO's System Impact Study shows that such a requirement is necessary to ensure safety or reliability. The power factor range standard can be met by using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and

switched capacitors if agreed to by the Transmission Owner, or a combination of the two. The Interconnection Customer shall not disable power factor equipment while the wind plant is in operation. Wind plants shall also be able to provide sufficient dynamic voltage support in lieu of the power system stabilizer and automatic voltage regulation at the generator excitation system if the System Impact Study shows this to be required for system safety or reliability.

iii. Supervisory Control and Data Acquisition (SCADA) Capability

The wind plant shall provide SCADA capability to transmit data and receive instructions from the Transmission Owner to protect system reliability. The Transmission Owner and the wind plant Interconnection Customer shall determine what SCADA information is essential for the proposed wind plant, taking into account the size of the plant and its characteristics, location, and importance in maintaining generation resource adequacy and transmission system reliability in its area.

Appendix H to LGIA Civil Specifications

GENERAL REQUIREMENTS

1. All safety and controls are the responsibility of contractor.
2. Protection of work site and property is responsibility of contractor.
3. Security of site during work is responsibility of contractor. Long term required security will be provided by contractor during turn over. This will include required fencing and barriers needed for safety and protection of assets. The plan will be reviewed and approved by LG&E/KU.
4. All erosion control during construction shall be by the contractor. Site will have long term erosion control measures in place when grading is done. This includes seeding when needed. Long term erosion control plan developed in accordance with Kentucky Stormwater Pollution Prevention Plan guidelines will be submitted to LG&E/KU for approval.

Definitions

The following terms when used in this specifications shall have the meanings specified below:

1. Company - Louisville Gas & Electric and Kentucky Utilities. (LLG&E/KU)
2. Contract - The General Terms and Conditions of Contract, the Specifications, the Bid, the Purchase Order, all plans and drawings and written instructions and other documents relating to the work to be done under the Contract approved or issued by the Company.
3. Contractor - The person, firm or corporation with whom the Company may enter into contract for the execution of the work herein specified or any part thereof.

4. Work - All services, labor, plant, equipment, materials, supplies, engineering and the like to be furnished by the Contractor at the jobsite and the performance of all operations required for construction, erection, assembly, installation, completion, testing, and start-up of the facility as described in this Specification.
5. Engineer - The person designated by the contractor to act as project manager for all work covered by this Contract.

CODES, REGULATIONS, AND STANDARDS:

1. All work will comply to the following codes, regulations, and standards:
 - a. IEEE, ASTM, OSHA, NESC, NEC, NFPA and local and regional codes and laws including authorities having jurisdiction. If there is conflicts between the codes the most conservative one will prevail. If the conflict cannot be resolved provide proposed solution to LG&E/KU for approval.

PRELIMINARY REQUIREMENTS

The following lists some of the basic information required by the contractor for the site preparation design and information shall be submitted to LG&E/KU for our records and approval.

1. An agreed upon general arrangement of the substation.
 - a. LG&E and KU must verify a suitable site layout for adherence to spacing standards and access for future maintenance.
2. Area maps (aerial photos if available).
3. Boundary survey with legal description of property.
4. Existing topographic drawing of selected site area showing ground elevations on a grid system at 1-foot minimum spacing. As-built survey with topography will be provided after construction is complete.
5. Existing topographic survey must also include the following:
 - a. Location and elevation of existing roads, railroads, ditch inverts, and culverts.
 - b. Location of pertinent overhead or underground utilities and the exact location and depth of any pipelines.
 - c. Location of the area's drainage exits.
 - d. High water elevation in area, if any.
 - e. Flood zone designation with base flood elevation, if any.
6. Soil borings in immediate site area. All soil borings and geotechnical data will be submitted to LG&E/KU throughout the project.
7. Customers review of state and local government regulations for stormwater management plan requirements. Many local governments have adopted storm drainage criteria and require that stormwater detention or retention basins be provided, and a few require zero discharge from the site. The State of Kentucky requires that projects with disturbed areas greater than 1-acre are required to develop a Stormwater Pollution Prevention Plan (SWPPP). Any reports or information submitted for permitting shall be submitted to LG&E/KU for review and subject to approval. A copy of all permits and permit reviews shall be supplied to LG&E/KU.

SURFACE AND DRAINAGE SYSTEMS

All required surface and drainage systems will be designed by the contractor. Submit drawings for review and approval before work is started.

The yard will be a sloped or flat yard design. If sloped the slope will be submitted to LG&E/KU for review and approval. Such a system consists of a gently sloping (0.5 percent to 0.75 percent) ground surface so that the water drains to the edge of the yard or to shallow ditches within the yard. The ditches may discharge into culverts or shallow open channels removing the runoff from the yard. A larger slope than listed above is not acceptable.

ROADS AND OTHER ACCESS

General Access Roads

Access roads into substation yards have to be adequate to sustain heavy equipment under all weather conditions including flood conditions. Long access roads require design considerations similar to secondary county or state roads. Any culverts or sewer crossings also need to be designed for anticipated heavy equipment loads. Roads bridges, culverts and all other roadways shall be designed for AASHTO H40 rating and capable of getting a large transmission transformer into the substation. This is required even if a transformer is not in the current design but needed for future substation expansion.

Grade

The maximum grade on the access road should generally not exceed 6 percent.

Curvature

The inside radius of the access road at 90 degree intersections with major roads should not be less than 15 meters (50 feet) in order to provide sufficient turning space for long vehicles.

Design

1. Access roads shall be about 6 meters (20 feet) wide. The road should be crowned at the center for drainage.
2. The subgrade for the road should be prepared and compacted to the same requirements as the embankment for the yard at a minimum.
3. Follow State highway department standard specifications.
4. The access road may consist of a 200 mm (8-inch) aggregate base course and a
5. 100 mm (4-inch) aggregate surface course.
6. Application of the wearing courses should be made in accordance with highway standard specifications.

Roadways in the Substation Yard

1. The entire yard will be considered as drivable by light traffic (AASHTO H20 rating).
2. Drives within the fenced yard for access to transformer banks or as a perimeter drive will be the same as for the access road designs (AASHTO H40).
3. The width may be reduced to 5 meters (16 feet) and inside radii for interior drives may be 7.5 meters (25 feet) or less if space is not available.
4. Culverts and cable trenches should also be designed for anticipated heavy equipment loads (AASHTO H40).

GROUNDING

The site locations shall have good grounding properties. If a poor site is purchased it would raise the costs of the substation to make provisions to correct for poor grounding conditions.

Provide the follow following work and information to LG&E/KU:

1. A geotechnical report including soil types and rock depth at a minimum depth of 10' below proposed final grade or until rock is encountered. If rock is encountered before 10', core 5' of rock. All additional geotechnical reports required for grading and site design will be completed and supplied to LG&E/KU.
2. A soil resistivity study under the proposed yard using the four point Wenner method or smart meter. The measurement should be taken to allow multi-layer resistivity modeling and go to the lowest depth as reasonably possible with a minimum of 15' depth. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval.
3. If the geotechnical report or the resistivity study indicates potential grounding issues with the site, LG&E/KU reserves the right for a resistance to remote ground measurement to be taken with a loss of potential measurement and shall be taken at the maximum distance away as practically possible. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval. A resistance to remote ground measurement is to be taken with a Loss of potential measurement and shall be taken at the maximum distance away as practically possible. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval.

ENVIRONMENTAL

Provide environmental information before the purchase or lease of the land and at any other times new design considerations or hazards are discovered.

Below are a list of minimum requirements.

1. Provide information with geotechnical report at a minimum:
 - a. Surface and bedrock geology
 - b. Slope stability and erosion potential
 - c. Permafrost
 - d. Existing Soil types
 - e. Water quantity (surface and groundwater), including hydrologic regime data and water withdraws.
 - f. Water resources
 - g. Flood levels, zones and relevant information.
2. Provide existing Vegetation types onsite including but not limited to information on:
 - a. Rare and endangered plants
 - b. Revegetation potential
 - c. Other relevant information.
3. Information on wildlife resources including but not limited to:
 - a. Wildlife populations and capabilities
 - b. Sensitive species, periods, and habitat
 - c. Hunting, hiking, and trapping activities
 - d. Wildlife management activities
 - e. Other relevant information.
4. Provide information on site and objects of historical, architectural, archaeological, paleontological, and scenic significance
5. Provide information on environmental hazards
 - a. Known and potential occurrence of hazards, such as snow avalanches, landslides, mudflows, windstorms, earthquakes, tidal waves, floods, and fire hazards
 - b. Existence of toxic or other hazardous materials on site
 - c. Government-owned land, ecological reserves, forest reserves, and other reserves and easements
 - d. Noise potential hazards and design consideration. Special sounds wall requirements.
 - e. Underground objects that may affect grounding or any other below grade work and excavations.
6. Provide information on any special vegetation, landscaping or visual wall required for nearby residents.

CONSTRUCTION AND DESIGN SPECIFICATIONS

1. All construction and design specification will be submitted for LG&E/KU review and is subject to approval to meet company and industry standards.
2. All drawings and equipment cut sheet will be provided to LG&E/KU for review and approval before any work is started. Any changes to the drawings or specifications to meet specifications, codes, permits or industry standards will be at the cost of the contractor.
3. The specifications listed in this document are minimum requirements. The contractor is responsible for all design and specifications for a complete and working system.

SITE PREPARATION AND EARTHWORK GENERAL SPECIFICATIONS.

Definitions

1. Backfill: Soil materials used to fill an excavation.
 - a. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - b. Final Backfill: Backfill placed over initial backfill to fill a trench.
2. Base Course: Layer placed between the subgrade and asphalt or concrete paving.
3. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
4. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
5. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of water.
6. Excavation: Removal of material encountered above subgrade elevations and removal of material below subgrade for foundations, trenches, drains, and tanks.
 - a. Additional Excavation: Excavation below indicated elevations when directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - b. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
 - c. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
7. Fill: Soil materials used to raise existing grades.
8. Rock: Rock material in beds, ledges, un-stratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, or ripping:
 - a. Excavation of Footings, Trenches, and Pits: Track-mounted hydraulic excavator; equipped with a 42-inch- (1065mm) wide, short-tip-radius rock bucket; rated at not less than 120-hp (89-kW) flywheel power with bucket-curling force of not less than 25,000 lbf (111 kN) and stick-crowd force of not less than 18,700 lbf (83 kN); measured according to SAE J-1179.
 - b. Bulk Excavation: Track-mounted loader; rated at not less than 210-hp (157-kW) flywheel power and developing a minimum of 45,000-lbf (200-kN) breakout force; measured according to SAE J-732.
 - c. Explosives: The use of explosives is NOT permitted.
9. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
10. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub base, drainage fill, or topsoil materials.
11. Utilities include on-site underground and above ground pipes, conduits, ducts, and cables, as well as underground services within buildings.

12. Grubbing: The removal of roots, shrubs, and other vegetation to a depth below the ground surface.
13. Stabilize: Placement of seed or crushed rock in order to prevent the erosion of soil.

Project Conditions

1. Lines and grades shall be as indicated on attached drawings. Contractor shall be responsible for locating or establishing benchmarks and property monuments as indicated. Contractor shall use these benchmarks and reference points and any other points that Contractor may need to establish in order to layout and construct the work properly.
2. Carefully maintain all bench marks and monuments and replace as directed if disturbed or destroyed at no additional cost to Owner.
3. Disposition of Existing Facilities, Structures and Property:
 - a. Adequately protect from damage all existing utilities, structures and property and remove or relocate only as indicated, specified or as directed by Owner.
 - b. It shall be the Contractor's responsibility to have existing underground utilities located and verified prior to construction activities.
 - c. Report inactive and abandoned utilities encountered in excavating operations. Remove, plug, or cap as directed by Owner.
 - d. Utilities to be Removed: Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
4. Tree Removal: Coordinate with Site Inspector before any trees are removed.
5. Protection of Trees: Protect tops, trunks, and roots of existing trees on project site and borrow sites which are to remain, as follows:
 - a. Box, fence around, or otherwise protect trees before any construction work is started.
 - b. Do not permit heavy equipment or stockpiles within branch spread.
 - c. Trim or prune to obtain working space in lieu of complete removal when possible. Conduct operation as follows:
 - i. With experienced personnel.
 - ii. Conform to good horticultural practice.
 - iii. Preserve natural shape and character.
 - iv. Protect cuts with approved tree paint.
 - d. Grade around trees as follows:
 - i. Trenching: Where trenching is required around trees that are to remain avoid cutting the tree roots by careful hand tunneling under or around the roots. Avoid injury to or prolonged exposure of roots.
 - e. Remove when damage occurs and survival is doubtful.
 - f. Replace with similar item when damaged through carelessness and so requested.
6. Environmental Protection:
 - a. Contractor shall employ construction methods and techniques that will result in the least detrimental impact upon the environment. Actions taken by the Contractor shall include, but are not limited to the following:
 - i. Contractor shall repair ruts before leaving the area. At the conclusion of each working day the site shall be left in a condition to prevent soil erosion due to a possible rainfall event.
 - ii. Areas that are damaged by construction activities shall be re-graded to their original condition and resurfaced as specified or as directed at no extra cost to Owner. Seeded or sodded areas shall be reestablished with grass as specified.
 - iii. Care should be taken to avoid oil or fuel spills and other pollution. Areas polluted shall be cleaned and restored to their original condition at no extra cost to Owner.
 - iv. If items or areas of possible archaeological interest are uncovered during construction, Contractor shall notify Owner immediately.
 - v. Contractor shall comply with all requirements of all permits issued for this Project.

- vi. Contractor shall be responsible for all operational aspects of storm water controls, including but not limited to, initial installations, inspections, and maintenance.
7. Geotechnical Report will be provided as an addendum once it has been completed and reviewed. Contractor is expected to comply with all the findings of this report. Engineering drawings and scope requirements will be reviewed and amended as necessary. If there are any expected conflicts due to the report findings, Contractor shall address these issues in the submitted proposal.

MATERIALS

Soil

1. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
2. Unsatisfactory Soil: ASTM D 2487 soil classification groups ML, MH, CH, OL, OH, and PT, or a combination of these group symbols.
 - i. Unsatisfactory Soil also includes Satisfactory Soil not maintained within 2 percent of optimum moisture content at time of compaction.
3. Backfill and Fill: Satisfactory Soil materials.
4. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
5. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (38-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
6. Engineered Fill: Satisfactory Soil materials
7. Bedding: Washed, narrowly graded mixture of crushed stone, or crushed or un-crushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
8. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or un-crushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
9. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
10. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
11. Structural Fill: Satisfactory Soil materials

Accessories

1. Drainage Fabric: Non woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - i. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
 - ii. Tear Strength: 40 lbf (178 N); ASTM D 4533.
 - iii. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
 - iv. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
 - v. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.
2. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

- i. Grab Tensile Strength: 200 lbf (890 N); ASTM D 4632.
- ii. Tear Strength: 75 lbf (333 N); ASTM D 4533.
- iii. Puncture Resistance: 90 lbf (400 N); ASTM D 4833.
- iv. Water Flow Rate: 4 gpm per sq. ft. (2.7 L/s per sq. m); ASTM D 4491.
- v. Apparent Opening Size: No. 30 (0.6 mm); ASTM D 4751.

Soil Sterilant

1. Sterilant shall be Hyvar as manufactured by E.I. duPont or a comparable product meeting requirements of State Environmental Protection Laws.
2. Application:
 - i. Subgrade must be approved by Owner prior to placing soil sterilant.
 - ii. Apply to all areas of the substation indicated to receive crushed rock surfacing and crushed rock base course.
 - iii. Apply prior to placing crushed rock.
 - iv. Apply according to manufacturer's recommendations.

Rip-Rap Material

1. Material shall meet the requirements of machined rip-rap (Class 1) given in INDOT Standard Specifications.
2. Stone shall be durable and of suitable quality to ensure permanence of the structure.
3. Quantity of rock with an elongation greater than 3:1 shall not exceed 20 percent of the mass. No stone shall have an elongation greater than 4:1.
4. Material shall be free from cracks, seams, or other defects that would tend to increase its deterioration and shall not have a loss of more than 12 percent after 5 cycles when tested for soundness with sodium sulfate as described in AASHTO T104.
5. Objectionable quantities of dirt, sand, clay and rock fines will not be permitted.
6. Place on the prepared base as indicated in such a manner as to produce a reasonably well graded mass of rock with a minimum practicable percentage of voids.
7. Place to its full course thickness in one operation and in a manner to avoid displacing the base material.
8. Finished rip-rap shall be free from objectionable pockets of small stones and clusters of larger stones. Hand place only if necessary to secure the desired results.
9. A tolerance of plus or minus 4 inches from the slope lines and grades will be allowed to the extremes that such a tolerance shall not be continuous over an area greater than 200 square feet.
10. Maintain the rip-rap protection until accepted and replace any material displaced at no additional cost to the Owner.

INSTALLATION

Preparation

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
2. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
3. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Follow requirements of the contractor-prepared SWPPP and state and local guidelines.

Clearing and Grubbing

1. Clear and grub all areas where earthwork is to be performed and any other areas beyond the earthwork limits where indicated.
2. Clearing:
 - i. Clearing includes felling and disposal of trees, brush, and all other vegetation found on or above the existing ground surface inside the clearing limits.
 - ii. Conduct work in a manner to prevent damage to property and to provide for the safety of employees and others.
 - iii. Keep operations within construction limits indicated.
3. Grubbing:
 - i. Grubbing includes the removal and disposal of all tree stumps and roots where backfill is to be placed and when the excavated material is to be used as backfill. Removal and disposal of tree stumps and roots larger than 3 inches in diameter will be required at all other locations.
 - ii. Backfill all excavated depressions with approved material and grade to drain.
4. Disposal of Debris:
 - i. Dispose of debris from clearing and grubbing at a location off the Job Site, as arranged for by Contractor, at no additional cost to Owner.
 - ii. Contractor may claim and salvage any timber or other debris that must be removed from the Job Site but shall not delay in any manner either this contract or other work with salvaging operations.

Dewatering

1. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
2. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - i. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - ii. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

Excavation, General

1. Unclassified Excavation is the excavation of rock, soil or any combination thereof to the indicated elevation.
 - i. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
 - ii. Rock excavation includes removal and disposal of rock.
2. All excavation for this Project shall be considered Unclassified Excavation. The Contractor shall neither request nor require additional fees from Owner for excavation of rock or other materials.

Approval of Subgrade

1. Notify Engineer when excavations have reached required subgrade.
2. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
3. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

4. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

Unauthorized Excavation

1. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Engineer.
 - i. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

Storage of Soil Materials

1. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - i. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - ii. Stockpiles shall be located outside of wetland boundaries and managed such that run-off does not impact the wetlands.

Backfill

1. Place and compact backfill in excavations promptly, but not before completing the following:
 - i. All excavation for structure or foundation shall be inspected by geotechnical testing personnel.
 - ii. Construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - iii. Surveying locations of underground utilities for record documents.
 - iv. Inspecting and testing underground utilities.
 - v. Removing concrete formwork.
 - vi. Removing trash and debris.
 - vii. Removing temporary shoring and bracing, and sheeting.
 - viii. Installing permanent or temporary horizontal bracing on horizontally supported walls.

Moisture Control

1. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within +3 to -2 percent of optimum moisture content.
 - i. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - ii. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

Compaction of Backfills and Fills

1. Place backfill and fill materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
2. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
3. Compact soil to not less than the following percentages of maximum dry unit density according to ASTM D 698 (Standard Proctor):
 - i. Under structures, building slabs, steps, pavements, and detention basin berms scarify and re-compact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material

at 98 percent. The upper 24 inches of fill (upper 12 inches in excavations) beneath proposed pavements and structures and pond bottoms shall be compacted to 98 percent maximum dry density.

- ii. Under walkways, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent.
- iii. Under lawn or unpaved areas, scarify and re-compact top 6 inches (150 mm) below subgrade and each layer of fill material at 90 percent.

Grading

1. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - i. Provide a smooth transition between adjacent existing grades and new grades.
 - ii. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
2. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - i. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).

Field Quality Control

1. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality control testing.
2. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
3. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.
4. Testing agency will test compaction of soils in place according to ASTM D 1556. Tests will be performed at the following locations and frequencies:
 - i. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
 - ii. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet (30 m) or less of wall length, but no fewer than two tests.
 - iii. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.
5. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and re-test until specified compaction is obtained.

Protection

1. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
2. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - i. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.
3. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

- ii. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

Disposal of Surplus and Waste Materials

1. Satisfactory Soil: Transport surplus satisfactory soil to designated storage areas at Job Site. Stockpile or spread soil as directed by Engineer.
2. Remove waste material, trash, and debris, and legally dispose of it off Owner's property, following any and all laws and regulations. If any spoils have unusual staining or odors, inform Owner immediately. Unsatisfactory soil should remain on site and used in other locations.

Maintenance and Repair

1. Maintenance:
 - i. Settling or erosion shall be filled, repaired and grades reestablished to elevations and slopes indicated.
2. Correction of Settlement:
 - i. Contractor is responsible for correcting any excessive settlement as determined by Owner, for the specific areas of backfill and damages created thereby within one year after acceptance of the Work.
 - ii. Make repairs within 10 days from and after due notification by Owner of backfill settlement and resulting damage.
 - iii. Make own arrangements for access to the site for purposes of repair.

**Appendix I to LGIA
Facilities Study Report**



PPL companies

**FS-LGE-GIS-2019-002
Facilities Study Report**

May 29, 2020

Study & Preliminary Report Completed By: LG&E/KU
Transmission

Report Prepared By:
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1. Executive Summary

A Facilities Study was performed by LG&E/KU for the following request:

**Table 1
Request Details**

Queue Position	Queue Date	County	State	Max Output (MW) S/W	Point of Inter-connection	In-Service Date	Inter-connection Service Type	Generator Type
LGE-GIS-2019-002	02/06/2019	Ballard	KY	104/104*	Grahamville-Wickliffe 161 kV Line	06/01/2023	NRIS/ERIS	Solar

*Customer reduced capacity from 110 to 104 for the facilities study

TranServ as Independent Transmission Organization (ITO) completed a Generator Interconnection (GI) System Impact Study (SIS). The GI SIS analyzed the impact of this Generator Interconnection, located near Paducah, Kentucky, in accordance with the LG&E and KU Large GI Study Criteria document as posted on the LG&E and KU Open Access Same-Time Information System (OASIS). Customer executed a Facility Study Agreement with for the ITO and LG&E and KU to complete a Facilities Study. LG&E and KU Services Company (LG&E-KU) contracted Black & Veatch (BV) to complete a +/-20% cost estimate study for the Generation Interconnect Request GI-2019-002 facility study. The request requires a new interconnection substation that will tap the existing 161 kV Grahamville to Wickliffe line in Ballard County, Kentucky.

The LG&E/KU Open Access Transmission Tariff (OATT) states that the Facilities Study will include a good faith estimate of (i) the cost of Direct Assignment Facilities to be charged to the Eligible Customer, (ii) the Eligible Customer’s appropriate share of the cost of any Network Upgrades, and (iii) the time required to complete such construction and initiate the requested service.

TranServ has reviewed the Facilities Study results from LG&E and KU and prepared this report in accordance with the LG&E and KU OATT.

2. Constraint Identified in the SIS

2.1 Steady State Constraints

In the SIS report, only LG&E and KU 2020 Summer Peak thermal constraints were identified. The LG&E and KU 2020 Summer Peak thermal constraints due to the subject request are shown in Table 2-1.

Table 2-1
LG&E and KU Thermal Constraints

Year / Season	Dispatch	Facility	Rating	Pre Project		Post Project		DF
				MVA	%	MVA	%	
All Summer Scenarios	All	Wickliffe 161/69 kV Tx	107	1	1%	113	105	99%

The above constraint was reevaluated in this facilities study. With reduction of LGE-GIS-2019-002 capacity from 110 MW to 104 MW, no overload is found in this facility study and no mitigation is required for the Wickliffe 161/69 kV transformer overload found in SIS.

2.2 Flowgate Analysis Results

No flowgate constraints due to the subject request were found in the SIS report.

2.3 Contingent Facility Analysis Results

There are no planned transmission improvements associated with any earlier queued LG&E and KU GI request. Thus, no study to determine whether or not those facilities would be contingent facilities for this request was performed.

2.4 Short Circuit Analysis Results

The Short Circuit Analysis results from the SIS indicate that the transmission system has adequate interrupting capabilities to accommodate the addition of the new solar generator

2.5 Stability Analysis Results from SIS

The Stability Analysis Results from the SIS were reviewed along with the stability issues found for the 3-breaker interconnection option in the SIS as part of this facilities study. The 3 breaker configuration was re-evaluated with the latest PSS/E version (33.12.1) that includes a more accurate and improved GI-2019-002 inverter model. Therefore, stability study results from SIS are replaced with facilities stability study results (provided in section 2.6).The stability analysis

was performed for both near term and out year summer peak, summer generation maximization, and light load system conditions with appropriate earlier queued generators included in the model.

2.6 Stability Study Analysis from the Facilities study

TO performed stability simulations considering 3 breaker interconnection option with the latest PSS/E version (33.12.1) and results are provided in this section. The ITO reviewed these results and agree with these results and conclusion.

2.6.1 Results

Criteria violations were identified with the original customer provided under frequency protection settings. The SIS report provides updated under frequency protection option 2 settings and these were implemented in the FS.

Table 2-2-A
Option 2: Modify Relay Pickup Time Settings (From SIS)

	Freq range		Relay Pick up time (sec)	Breaker Delay Time (sec)
ITO recommended settings	FRQTPAT-Instance 13 : 40-65 Hz		0.2	0.01
	FRQTPAT-Instance 18 : 57-80 Hz		0.2	0.01
	FRQTPAT-Instance 19 : 55-80 Hz		0.2	0.01

The initial results indicated that the GI-2019-002 solar generation would trip due to under-voltage with the customer provided voltage relay settings. It was determined that the customer provided relay settings were more stringent than the recovery criteria outlined in the TO performance documentation. The customers relay settings were adjusted as shown below to account for this issue and ensure that PRC-024 criteria is maintained. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

Table 2-2-B
Modify Relay Pickup Time and Voltage Range

MINS	Protection module	Machine Bus Number		ID	Lower Bandwidth	High Bandwidth	Relay pick up Time	Breaker Delay Time
6	VTGTPAT-Used in the SIS	991044	991044	1	0.89	1.8	3	0.01
6	VTGTPAT-Modified for the Facility Study	991044	991044	1	0.8	1.8	4	0.01

Also, criteria violations were identified in the SIS with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

2.6.1.1 Disturbance Evaluation P2-P7

The ITO studied and confirmed the lack of issues with both P1 and P6 contingencies as outlined in the SIS report. Therefore, the analysis consisted of P2-P7 analysis. All monitored voltages and angles as outlined in the SIS study were found to be within acceptable limits with the addition of the 104.0 MW solar generation at the point of interconnection. It was determined that there were no criteria violations for the disturbances evaluated in this analysis.

2.6.1.2 Impedance swing

To address Sections 4.1.2 and 4.3.1.3 of the TPL-001-4 standard, stability analysis was performed to assess tripping due to transient swings. The goal of the apparent impedance swing test is to determine if there are any breaker mis-operations as a result of an apparent impedance swing during the stability simulation. The breakers need to be able to clear the fault during normal or delayed clearing events. However, non-faulted facilities need to remain in service. Distance relays, which are designed to determine if a fault is on the system, could mis-operate due to an apparent impedance swing resulting in tripping of facilities that are not needed in order to clear the fault. These distance relay settings are defined in the SIS report. It was determined that there were no misoperations for the disturbances evaluated in this analysis.

2.6.2 Conclusion

Criteria violations were identified with the original customer provided under voltage and under frequency protection settings. Updated settings are provided in the SIS and FS to alleviate these issues. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

With the newly updated protections settings, criteria violations were identified with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-

002 POI 161 kV line and the Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

The two breaker interconnection option was not considered in this study since a 3 breaker interconnection option (figure 1) shows no need for any additional mitigations other than the study recommended relay settings and it is a more reliable standard interconnection for the LGE and KU system.

When using the ITO and TO recommendations from the SIS and FS. All study disturbance (disturbances as outlined in the SIS study) results were found to be within criteria with the addition of the 104.0 MW solar generation at the point of interconnection.

2.7 Stiffness Verification due to Inverter Based Resource Interconnection

The GIS-2019-002 Short circuit ratio (SCR) was found to exceed the minimum requirement of 2.0. Due to the location of the GIS-2019-002 POI, the Weighted SCR (WSCR) did not apply. There are no Grid Stiffness constraints to granting the GIS2019-002 GI request.

3. Affected System Impacts from SIS

Tables 3-1 and 3-2 from the SIS report documented the Ad Hoc Study Group Comments which relate to independent testing performed by the Ad Hoc Study Group members consistent with the allowance for such testing in the LG&E and KU TSR Criteria document.

Table 3-1
Ad Hoc Study Group Independent Study Comments

Ad Hoc Group Member	Date Received	Ad Hoc Group Member Comment provided within the October 31, 2019 Deadline
No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request		

4. Facilities Study Results from LG&E and KU

4.1 Methodology

The following terms are defined in this facilities study report

1. **New Network Facilities (NNF)** - additions, modifications, and upgrades to the Transmission Owner's system required at or beyond the Point of Interconnection (POI) to accommodate the interconnection of the Generating Facility to the Transmission System. It is possible for system network power to flow through NNF equipment, along with generation facility power.
2. **Transmission Interconnection Facilities (TIF)** - all facilities and equipment owned by the Transmission Owner from the Point of Interconnection (POI) to the Point of Change of Ownership (PCO); including any modifications, additions, or upgrades to such facilities and equipment. Transmission Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Generator Upgrades, Stand Alone Network Upgrades, or Network Upgrades. Only generation facility power can flow through TIF equipment.
3. **Generation Owner Facilities** – all facilities and equipment owned by the Interconnection Customer starting at the Point of Change of Ownership (PCO).
4. **Point of Interconnection (POI)** – the point where the transmission interconnection facilities connect to the new network upgrades.
5. **Point of Change of Ownership (PCO)** – the point where the Interconnection Customer's facilities connect to the transmission interconnection facilities.
6. **Distribution Upgrades (Distribution Facilities)**
Article 11 of the LGIA specifies which party (Transmission or Generator Owner) has a construction obligation and who bears the expense of that obligation. Based on the requirements within the LGIA:
 - **Generator Owner Facilities:** The Generator Owner is responsible for building, owning, and maintaining the assets. The Generator Owner bears the expense for these assets.
 - **Transmission Interconnection Facilities (TIF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. The Generator Owner bears the non-refundable expense for these assets (Generation contribution to Transmission).
 - **Network Facilities (NF) (include NNF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. However, the Generator Owner funds the initial expense for the Network Facilities unless LG&E and KU Transmission chooses to fund them. Any funds received from the Generator will be refunded to the Generator,

plus interest, as the Generator takes transmission service, or repayment can be set up over a defined period. The Terms of payment for the Network Facilities will be determined in the negotiation period (identified in the LG&E and KU OATT: Attachment M Section 11) of the LGIA.

- **Distribution Facilities:** LG&E and KU Transmission does not own any Distribution Assets. So, Distribution Asset Costs identified would be reviewed and determined with the local distribution utility.

7. **Interconnection Customer (IC) - The Generator Owner.**

The LGE-GIS-2019-002 Solar Transmission Estimate was created following the below steps:

- a. Engineering and Project Management costs were estimated. LG&E and KU project Management & Engineering labor were estimated at 20% of the contracted project Management & Engineering labor cost.
- b. Construction Management labor costs were estimated. LG&E and KU Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- c. The Generator Owner facilities are not included in the estimates.
- d. The Transmission Owner's Telecommunications Department provided an estimate for telecom facilities.
- e. Cost estimates were broken down between Company labor, contracted labor, materials, and contingency.
- f. Pricing provided by the vendor was combined with Transmission Owner's burdens and contingency cost
- g. Pricing provided by the Transmission Owner's Telecommunications Department was aggregated in the cost summary table.
- h. The responsibility for costs was determined per the Transmission Owner's *Allocation of Costs for Generator Interconnections* document, effective January 1, 2018, for a new three breaker ring bus configuration. As such, all costs associated with this estimate are categorized as Transmission Interconnect Facilities (TIF). To remain consistent with past Facility Study reports, and to emphasize that all costs will be the sole responsibility of the Interconnection Customer, the cost estimate in Table 4-1: Estimated Costs of Facilities and Section 4.5.2 Cost Estimate Summary includes Transmission Interconnect Facilities (TIF). New Network Facilities will total to \$9,801,317 USD for this scope.

4.2 Major Project Assumptions, Constraints, and Risks

4.2.1 Assumptions and Clarifications

The cost estimates prepared for this interconnect request are based on the following assumptions.

- The IC's interconnection circuit construction and the IC's generation facilities are not included in this study.
- Estimate accuracy is +/- 20%.
- Internal LG&E-KU costs for Project Management & Engineering labor were estimated at 20% of the contracted Project Management & Engineering labor costs.
- Internal LG&E-KU costs for Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- Telecom labor and material costs were provided by LG&E-KU and are assumed to be 100% LG&E-KU costs.
- LG&E-KU burdens and contingency were estimated internally by LG&E-KU.
- All contracted costs presented within this report include 6% escalation on cost, contractor burdens, and markups.
- Union Labor rates were utilized for construction labor.
- Materials are assumed to be tax exempt. No sales taxes are included in the estimate.
- Insurance is included for contracted costs.
- Engineering, Project and Construction Management, and Construction Mobilization/Demobilization costs were allocated between Network Facility (90%) and Transmission Interconnection Facility (10%) costs.

4.2.1.1 Construction

- Temporary construction power is assumed to be provided by LG&E-KU.
- Adequate site access will be provided by the IC.
- Costs for subcontracted site security are included for non-work hours, holidays, and weekends for the duration of construction.
- Costs are included for a part-time onsite Construction Safety manger.
- Temporary laydown, matting, or other improvements are not included.

4.2.1.2 Civil-Site Development

- Site development for the access road, substation pad, and transmission cut-in will be by the IC and is not included in the cost of this estimate. It is assumed that all property purchase, site clearing/grubbing, grading, landscaping, drainage, storm water, and/or erosion control design, permitting, and construction will be provided by the IC. The IC will provide a rough graded and fenced pad with a 20' swing gate per LG&E-KU standards.
- Boundary, topographic, and/or environmental surveys are not included and are assumed to be by the IC.
- Site Planning, Zoning, Easement and/or Real Estate negotiations or approvals are not included and are assumed to be by the IC.
- All environmental and other necessary permits to complete the site development construction will be secured and paid for by the IC.

4.2.1.3 Civil-Structural

- H-frame and lightning mast structures will be comprised of bent plate and will be detail- designed by a steel fabricator, with loads provided by the substation engineer.
- All remaining steel will consist of standard AISC shapes to be detail-designed by the substation engineer.
- Geotechnical soil information was not available at the time of the estimate completion. Black & Veatch completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate.
- Based on the proposed location of the site, it is expected that the site will fall under Seismic Design Category D. Liquefaction was not considered for foundation design estimates.
- The soil conditions are assumed to be conducive for the installation of drilled pier foundations, but will require additional detailing to meet the building code requirements for Seismic Design Category D. Tie spacing is assumed to be 4" on center.
 - The H-frame and H-frame with switch foundations are assumed to be 5' diameter piers extending 22' and 25', respectively.
 - The lightning mast foundations are assumed to be 4' diameter piers extending 18'.

- All substation structures are supported on 3' diameter, 9' long piers, with the exception of the high bus and high disconnect switch structures, which are supported on 12' long piers.
- The control house is supported by (10) 2.5' diameter, 15' long drilled piers.
- The control house is assumed to be constructed at approximately grade elevation. It will not be elevated for flood considerations. No stairs are assumed to be required.

4.2.1.4 Relaying & Communications

- The IC will supply the fiber communication (OPGW) channel between the IC collector substation and the LG&E-KU station.
- The estimate includes costs for the fiber connection from the new LG&E-KU Control House to the H-Frame dead end structure.
- The IC will supply a line protection relay panel in the IC-owned collector substation to interface with the LG&E-KU-owned line protection relay panel in the interconnection station for coordinated protection of the IC line segment.
- LG&E-KU Telecom will design and construct a 195' tall microwave tower to be installed inside the LG&E-KU substation. Physical space has been allocated for the tower in the conceptual substation arrangement.

4.2.2 Project Risks and Constraints

- Geotechnical soil information was not available at the time of the estimate completion. The vendor completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. The site is anticipated to have clay soil over shallow limestone rock and require site grading to balance the station pad elevation. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate. Site soil conditions that differ from anticipated conditions could have significant impact on foundation design and below grade construction.
- No property survey information was available at the time of the conceptual substation design and cost estimate. The location of the network and interconnection facilities were identified based on aerial imagery and partial property parcel information. Changes to the physical location of the facilities could impact costs.

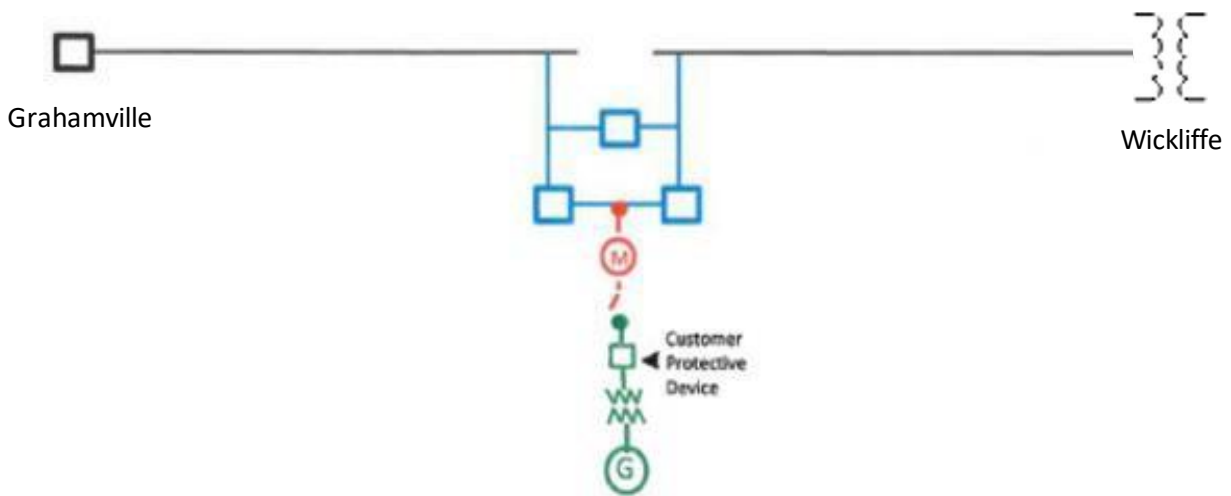
- Material and labor availability at the time of project execution could have significant cost impacts.

4.3 Interconnection Facilities Needs

Figure 1 shows the division of responsibility for a new three breaker ring bus configuration, per the Transmission Owner's Allocation of Costs for Generator Interconnections document, effective January 1, 2018.

The new interconnection facility will be constructed adjacent the IC's collector substation. The IC will be responsible for the design, construction, and permitting of the 161kV transmission line from their facilities to the Point of Change of Ownership (PCO) at the LGE-GIS-2019-002.

Figure 1: Point of Interconnection



Legend:

- Black = Existing Transmission Facilities
- Blue = New Network Facilities
- Red = Transmission Interconnection Facilities
- (M) = Interconnection Metering and Associated Equipment
- Green = Generation Facilities
- = Point of Interconnection
- = Point of Change of Ownership

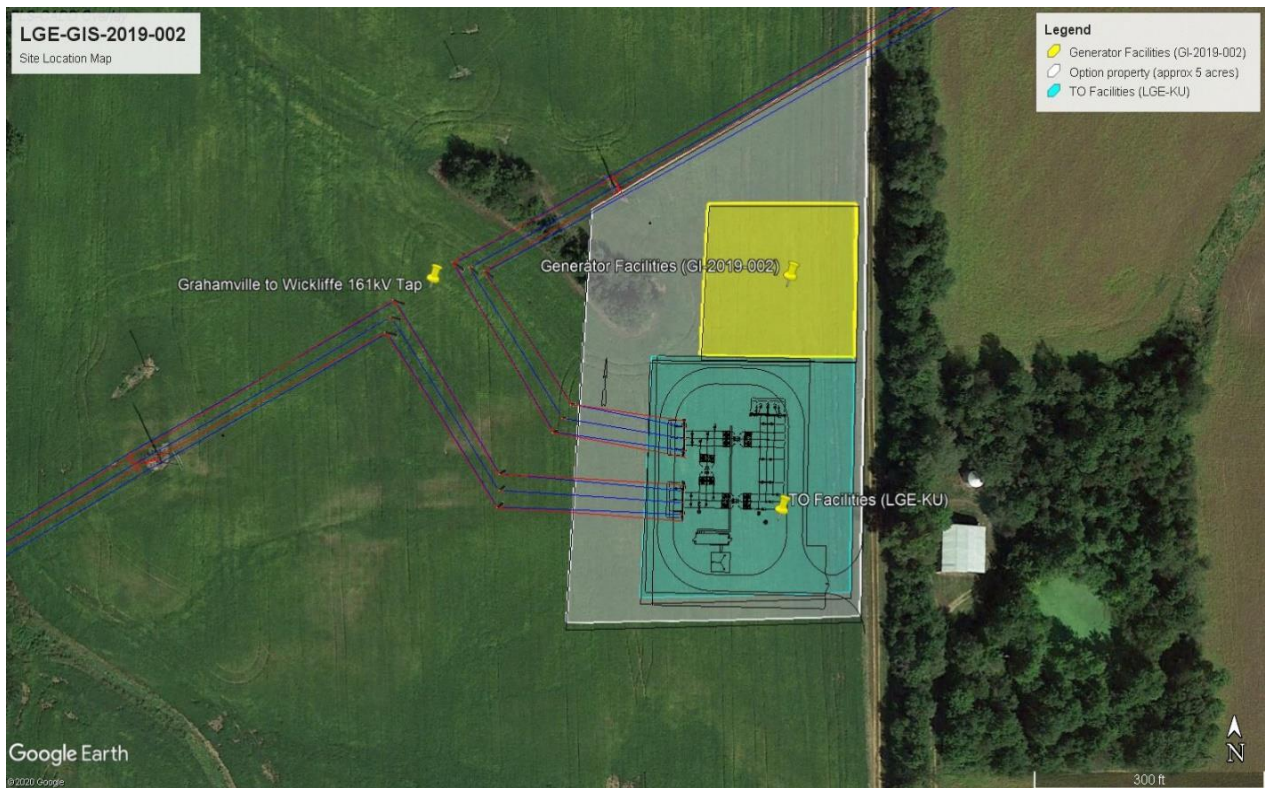
Details of the Transmission Interconnection Facilities and New Network Facilities required for the generation interconnection are provided in Section 4.5.

4.4 Description of Upgrades

This section describes facilities identified to be installed, replaced, and/or upgraded by LG&E-KU to accommodate the project. During detailed design other components may be identified for installation or replacement due to this interconnection.

The conceptual station arrangement developed for this estimate is included as Appendix A. The proposed station arrangement and location relative to the transmission corridor and the IC facilities is shown below in Figure 2. The approximate latitude and longitude of the POI is 37° 1'3.21"N, 88°54'50.30"W.

Figure 2. Project Location Map



The locations of the interconnection facilities were selected based on the following criteria:

- The anticipated size of the new 161kV station

- The proximity and orientation of the station to the existing 161kV transmission corridor, and
- The approximate interconnect facility boundary provided by the IC (See Appendix B)

4.5 Total Conceptual Cost Estimate: (Total Estimated Cost \$10,795,163 USD)

The cost estimates are based on a ring bus interconnection configuration as shown in Figure 1 in section 4.3 and the assumptions provided in the section 4.2. The estimated total project cost is estimated with +/- 20% accuracy.

4.5.1 Generator Owner Facilities

The generator owner is responsible for the installation and costs for the generator, step up transformer and customer protective devices up to the Transmission Owner (TO) metering equipment. The customer is responsible for determining the generator owner costs for the facilities owned and operated by the customer.

4.5.2 Transmission Interconnection Facilities: (Total Estimated Cost \$993,846)

The transmission interconnection facilities will include all equipment and materials at the interconnection facility between the Point of Ownership Change and the Point of Interconnection. The required equipment and materials are identified below, and a summary of the interconnection facilities costs are provided in Table 4-1.

4.5.2.1 Station

The transmission interconnection facilities will include the following:

4.5.2.1.1 High Voltage

- One (1) 161kV Motor-Operated Disconnect Switch
- Three (3) 161kV Surge Arresters
- Three (3) 161kV Metering CCVTs
- Three (3) 161kV Metering CTs

4.5.2.1.2 Civil/Structural

- One (1) Steel A-Frame structure
- Six (6) 1-Phase CCVT Supports

4.5.2.1.3 Protection & Control

- One (1) New Control House Space Allocation consisting of below relay panels:
- (1) line protection panel for GI Interconnect
 - (1) metering panel for GI
- (1) RTU panel
- AC/DC systems

4.5.3 Transmission Lines

Not applicable.

4.5.3.1 Telecommunication Facilities

- Not applicable.

Table 4-1
Transmission Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$287,730
Contract Labor	\$47,760
Contracted Materials	\$568,006
Company Materials	\$0
Contingency	\$90,350
Total	\$993,846

4.5.4 Network Facilities: (Total Estimated Cost \$9,801,317 USD)

4.5.4.1 Network Interconnection Facilities: (Total Estimated Cost \$9,801,317)

LG&E/KU and the vendor combined cost estimate for network interconnection facilities is shown in Table 4-2 and includes the following:

4.5.4.1.1 Station

- The new network interconnection facility will be a three (3) breaker ring bus arrangement with three (3) 161kV lines (Grahamville, Wickliffe, & GI Interconnect) and the following equipment:

4.5.4.1.2 High Voltage

- Three (3) 161kV Circuit Breakers
- Six (6) 161kV Manually Operated Disconnect Switches
- Six (6) 161kV Surge Arresters
- Six (6) 161kV CCVTs
- Two (2) 161kV SSVTs

4.5.4.1.3 Civil/Structural

- Two (2) Steel H-Frame structures
- Five (5) 3-Phase High Bus Supports
- Twelve (12) 1-Phase Low Bus Supports
- Six (6) Switch Support Stands
- Six (6) 1-Phase CCVT Supports
- Two (2) SSVT Supports
- One (1) Lightning Mast

4.5.4.1.4 Protection & Control

- One (1) Small (14' x 42') control house consisting of the following relay panels:
 - (2) line protection panels for Grahamville & Wickliffe & GI Interconnect
 - (2) Digital communications paths, (1) associated with the Grahamville line and (1) associated with the Wickliffe line
 - (1) RTU panel
 - (1) DFR panel
 - AC/DC systems
- One (1) line protection replacement panel at Wickliffe

4.5.4.2 Transmission Lines

- Four (4) 161kV three (3) pole steel dead end structures and foundations
- Hardware and Conductor for taps from existing 161kV line to the station structure

4.5.4.3 Telecommunication Facilities

- One (1) 195' tall Microwave tower and foundations
- Antennae systems
- MW Radio HS Terminal
- Digital Multiplex Systems and Channels
- DC Power

Table 4-2
Network Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$3,995,967
Contract Labor	\$937,195
Contracted Materials	\$3,195,551
Company Materials	\$781,575
Contingency	\$891,029
Total	\$9,801,317

4.5.5 Distribution Facilities: (Total Estimated Cost \$0 USD)

No distribution facility upgrades have been identified.

5. Conclusion and Project Completion Timeframes

The planned in-service date requested by the Interconnection Customer is June 1, 2023. The Conceptual Milestone Schedule (Table 5-1) to meet the requested in-service date.

Table 5-1 Conceptual Milestone Schedule

Milestone Activity	Milestone Dates
Project Initiation	June 2021
NTP for Engineering, Procurement and Construction	1-Mar-22
Engineering	1-Mar-22 to 1-Sep-22
Procurement	1-May-22 to 1-Nov-22
Construction Mobilization	1-Sep-22
Testing & Commissioning	1-Jun-23
In-Service Date	1-Jun-23

The overall estimated timeline for this project is approximately 24 months from the date of the interconnect agreement. This includes approximately six (6) to nine (9) months for project initiation and 15 to 18 months for the engineering, procurement, and construction phases. This estimate includes the assumption that the project schedule would not be impacted by storm damage and restoration, time of year limitations, permitting issues, outage scheduling, system emergencies, and contractor and equipment availability, or other unforeseen circumstances.

Customer must work with the TO to provide relay settings as identified in the section 2.6.1 (see Table 2-2-A and 2-2-B in this report). Interconnection to LG&E and KU system is contingent on steady state, short circuit and dynamic model, assumptions and settings used in the SIS and facilities study.

6. References

[1]https://www.oasis.oati.com/woa/docs/LGEE/LGEEdocs/Allocation_of_Costs_for_Generator_Interconnections_effective_1-1-2018.pdf

Appendix A. Conceptual Substation Layout

The appendix A of this report is available on the LG&E and KU Critical Energy Infrastructure Information (CEII) File Transfer Protocol (FTP) site. The LG&E and KU secure CEII FTP site URL is: <https://eftws.lge-ku.com/EFTClient/Account/Login.htm>.

Appendix B. Approximate Property Boundaries



AMENDED AND RESTATED
LARGE GENERATOR INTERCONNECTION AGREEMENT (LGIA)

Entered into by

Louisville Gas and Electric Company

And Kentucky Utilities Company

And

Song Sparrow Solar, LLC

**APPENDIX 6 TO THE LGIP
STANDARD LARGE GENERATOR
INTERCONNECTION AGREEMENT (LGIA)**

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**AMENDED AND RESTATED
STANDARD LARGE GENERATOR INTERCONNECTION AGREEMENT**

THIS STANDARD LARGE GENERATOR INTERCONNECTION AGREEMENT ("Amended Agreement" or "Amended LGIA") is made and entered into this ____ day of _____ 2023, by and between Song Sparrow Solar LLC, a limited liability company organized and existing under the laws of the State of Kentucky ("Interconnection Customer" with a Large Generating Facility), and Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company ("KU"), each a corporation organized and existing under the laws of the State/Commonwealth of Kentucky ("Transmission Owner"). Interconnection Customer and Transmission Owner each may be referred to as a "Party" or collectively as the "Parties."

Recitals

WHEREAS, Interconnection Customer intends to own, lease and/or control and operate the Generating Facility identified as a Large Generating Facility in Appendix C to this Amended Agreement; and,

WHEREAS, Interconnection Customer and Transmission Owner have agreed to enter into this Amended Agreement for the purpose of interconnecting the Large Generating Facility with the Transmission Owner's Transmission System;

WHEREAS, Interconnection Customer and Transmission Owner have agreed to amend this LGIA to reflect the updated Commercial Operation Date of the Generating Facility, and corresponding milestones in Appendix B.

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein, it is agreed:

When used in this Amended LGIA, terms with initial capitalization that are not defined in Article 1 shall have the meanings specified in the Article in which they are used or in the Open Access Transmission Tariff (OATT).

Article 1. Definitions

Adverse System Impact shall mean the negative effects due to technical or operational limits on conductors or equipment being exceeded that may compromise the safety and reliability of the electric system.

Affected System shall mean an electric system other than the Transmission Owner's Transmission System that may be affected by the proposed interconnection.

Affected System Operator shall mean the entity that operates an Affected System.

Affiliate shall mean, with respect to a corporation, partnership or other entity, each such other corporation, partnership or other entity that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such corporation, partnership or other entity.

Ancillary Services shall mean those services that are necessary to support the

transmission of capacity and energy from resources to loads while maintaining reliable operation of the Transmission Owner's Transmission System in accordance with Good Utility Practice.

Applicable Laws and Regulations shall mean all duly promulgated applicable federal, state and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any Governmental Authority.

Applicable Reliability Council shall mean the reliability council applicable to the Transmission System to which the Generating Facility is directly interconnected.

Applicable Reliability Standards shall mean the requirements and guidelines of NERC, the Applicable Reliability Council, and the Balancing Authority Area of the Transmission System to which the Generating Facility is directly interconnected.

Balancing Authority Area shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Balancing Authority Areas and contributing to frequency regulation of the interconnection. A Balancing Authority Area must be certified by the Applicable Reliability Council.

Base Case shall mean the base case power flow, short circuit, and stability data bases used for the Interconnection Studies by the ITO, Transmission Owner or Interconnection Customer.

Breach shall mean the failure of a Party to perform or observe any material term or condition of the Standard Large Generator Interconnection Agreement.

Breaching Party shall mean a Party that is in Breach of the Standard Large Generator Interconnection Agreement.

Business Day shall mean Monday through Friday, excluding Federal Holidays.

Calendar Day shall mean any day including Saturday, Sunday or a Federal Holiday.

Clustering shall mean the process whereby a group of Generator Interconnection Requests is studied together, instead of serially, for the purpose of conducting the Interconnection System Impact Study.

Commercial Operation shall mean the status of a Generating Facility that has commenced generating electricity for sale, excluding electricity generated during Trial Operation.

Commercial Operation Date of a unit shall mean the date on which the Generating Facility commences Commercial Operation as agreed to by the Parties pursuant to Appendix E to the Standard Large Generator Interconnection Agreement.

Confidential Information shall mean any confidential, proprietary or trade secret information of a plan, specification, pattern, procedure, design, device, list, concept, policy or

compilation relating to the present or planned business of a Party, which is designated as confidential by the Party supplying the information, whether conveyed orally, electronically, in writing, through inspection, or otherwise.

Default shall mean the failure of a Breaching Party to cure its Breach in accordance with Article 17 of the Standard Large Generator Interconnection Agreement.

Dispute Resolution shall mean the procedure for resolution of a dispute between the Parties in which they will first attempt to resolve the dispute on an informal basis.

Distribution System shall mean the Transmission Owner's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances. The voltage levels at which distribution systems operate differ among areas.

Distribution Upgrades shall mean the additions, modifications, and upgrades to the Transmission Owner's Distribution System at or beyond the Point of Interconnection to facilitate interconnection of the Generating Facility and render the transmission service necessary to effect Interconnection Customer's wholesale sale of electricity in interstate commerce. Distribution Upgrades do not include Interconnection Facilities.

Effective Date shall mean the date on which the Standard Large Generator Interconnection Agreement becomes effective upon execution by the Parties subject to acceptance by FERC, or if filed unexecuted, upon the date specified by FERC.

Emergency Condition shall mean a condition or situation: (1) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (2) that, in the case of the Transmission Owner, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to Transmission Owner's Transmission System, Transmission Owner's Interconnection Facilities or the electric systems of others to which the Transmission Owner's Transmission System is directly connected; or (3) that, in the case of Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Generating Facility or Interconnection Customer's Interconnection Facilities. System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by the Standard Large Generator Interconnection Agreement to possess black start capability.

Energy Resource Interconnection Service shall mean an Interconnection Service that allows the Interconnection Customer to connect its Generating Facility to the Transmission Owner's Transmission System to be eligible to deliver the Generating Facility's electric output using the existing firm or nonfirm capacity of the Transmission Owner's Transmission System on an as available basis. Energy Resource Interconnection Service in and of itself does not convey transmission service.

Engineering & Procurement (E&P) Agreement shall mean an agreement that authorizes the Transmission Owner to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection in order to advance the

implementation of the Generator Interconnection Request.

Environmental Law shall mean Applicable Laws or Regulations relating to pollution or protection of the environment or natural resources.

Federal Power Act shall mean the Federal Power Act, as amended, 16 U.S.C. §§ 791a et seq.

FERC shall mean the Federal Energy Regulatory Commission (Commission) or its successor.

Force Majeure shall mean any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A Force Majeure event does not include acts of negligence or intentional wrongdoing by the Party claiming Force Majeure.

Generating Facility shall mean Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Generator Interconnection Request, but shall not include the Interconnection Customer's Interconnection Facilities.

Generating Facility Capacity shall mean the net capacity of the Generating Facility and the aggregate net capacity of the Generating Facility where it includes multiple energy production devices.

Generator Interconnection Request shall mean an Interconnection Customer's request, in the form of Appendix 1 to the Standard Large Generator Interconnection Procedures, in accordance with the Tariff, to interconnect a new Generating Facility, or to increase the capacity of, or make a Material Modification to the operating characteristics of, an existing Generating Facility that is interconnected with the Transmission Owner's Transmission System.

Good Utility Practice shall mean any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority shall mean any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include Interconnection Customer, ITO, Transmission Owner, or any Affiliate thereof.

Hazardous Substances shall mean any chemicals, materials or substances defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "hazardous constituents," "restricted hazardous materials," "extremely hazardous substances," "toxic substances," "radioactive substances," "contaminants," "pollutants," "toxic pollutants" or words of similar meaning and regulatory effect under any applicable Environmental Law, or any other chemical, material or substance, exposure to which is prohibited, limited or regulated by any applicable Environmental Law.

Independent Transmission Organization shall mean the entity (referred to herein as the "ITO") to which LG&E/KU have delegated the responsibility and authority to administer the Tariff.

Initial Synchronization Date shall mean the date upon which the Generating Facility is initially synchronized and upon which Trial Operation begins.

In-Service Date shall mean the date upon which the Interconnection Customer reasonably expects it will be ready to begin use of the Transmission Owner's Interconnection Facilities to obtain back feed power.

Interconnection Customer shall mean any entity, including the Transmission Owner or any of the Affiliates or subsidiaries of the Transmission Owner, that proposes to interconnect its Generating Facility with the Transmission Owner's Transmission System.

Interconnection Customer's Interconnection Facilities shall mean all facilities and equipment, as identified in Appendix A of the Standard Large Generator Interconnection Agreement, that are located between the Generating Facility and the Point of Change of Ownership, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the Transmission Owner's Transmission System. Interconnection Customer's Interconnection Facilities are sole use facilities.

Interconnection Facilities shall mean the Transmission Owner's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to the Transmission Owner's Transmission System. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Interconnection Facilities Study shall mean a study conducted for the Interconnection Customer by the Transmission Owner as directed, and subject to review by, the ITO, in order to determine a list of facilities (including Transmission Owner's Interconnection Facilities and Network Upgrades as identified in the Interconnection System Impact Study), the cost of those facilities, and the time required to interconnect the Generating Facility with the Transmission Owner's Transmission System. The scope of the study is defined in Section 8 of the Standard Large Generator Interconnection Procedures.

Interconnection Facilities Study Agreement shall mean the form of agreement contained in Appendix 4 of the Standard Large Generator Interconnection Procedures for

conducting the Interconnection Facilities Study.

Interconnection Feasibility Study shall mean a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to the Transmission Owner's Transmission System, the scope of which is described in Section 6 of the Standard Large Generator Interconnection Procedures.

Interconnection Feasibility Study Agreement shall mean the form of agreement contained in Appendix 2 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection Feasibility Study.

Interconnection Service shall mean the service provided by the Transmission Owner associated with interconnecting the Interconnection Customer's Generating Facility to the Transmission Owner's Transmission System and enabling it to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Standard Large Generator Interconnection Agreement and, if applicable, the Transmission Owner's Tariff.

Interconnection Study shall mean any of the following studies: the Interconnection Feasibility Study, the Interconnection System Impact Study, and the Interconnection Facilities Study described in the Standard Large Generator Interconnection Procedures.

Interconnection System Impact Study shall mean an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of Transmission Owner's Transmission System and, if applicable, an Affected System. The study shall identify and detail the system impacts that would result if the Generating Facility were interconnected without project modifications or system modifications, focusing on the Adverse System Impacts identified in the Interconnection Feasibility Study, or to study potential impacts, including but not limited to those identified in the Scoping Meeting as described in the Standard Large Generator Interconnection Procedures.

Interconnection System Impact Study Agreement shall mean the form of agreement contained in Appendix 3 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection System Impact Study.

IRS shall mean the Internal Revenue Service.

Joint Operating Committee shall be a group made up of representatives from Interconnection Customers and the Transmission Owner to coordinate operating and technical considerations of Interconnection Service.

Large Generating Facility shall mean a Generating Facility having a Generating Facility Capacity of more than 20 MW.

Loss shall mean any and all losses relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's performance, or non-performance of its obligations under the Standard Large Generator Interconnection Agreement on behalf of the indemnifying Party, except in cases of gross

negligence or intentional wrongdoing by the indemnifying Party.

Material Modification shall mean those modifications that have a material impact on the cost or timing of any Generator Interconnection Request with a later queue priority date.

Metering Equipment shall mean all metering equipment installed or to be installed at the Generating Facility pursuant to the Standard Large Generator Interconnection Agreement at the metering points, including but not limited to instrument transformers, MWh-meters, data acquisition equipment, transducers, remote terminal unit, communications equipment, phone lines, and fiber optics.

NERC shall mean the North American Electric Reliability Council or its successor organization.

Network Resource shall mean any designated generating resource owned, purchased, or leased by a Network Customer under the Network Integration Transmission Service Tariff. Network Resources do not include any resource, or any portion thereof, that is committed for sale to third parties or otherwise cannot be called upon to meet the Network Customer's Network Load on a non-interruptible basis.

Network Resource Interconnection Service shall mean an Interconnection Service that allows the Interconnection Customer to integrate its Large Generating Facility with the Transmission Owner's Transmission System (1) in a manner comparable to that in which the Transmission Owner integrates its generating facilities to serve native load customers; or (2) in an RTO or ISO with market based congestion management, in the same manner as Network Resources. Network Resource Interconnection Service in and of itself does not convey transmission service.

Network Upgrades shall mean the additions, modifications, and upgrades to the Transmission Owner's Transmission System required at or beyond the point at which the Interconnection Facilities connect to the Transmission Owner's Transmission System to accommodate the interconnection of the Large Generating Facility to the Transmission Owner's Transmission System.

Notice of Dispute shall mean a written notice of a dispute or claim that arises out of or in connection with the Standard Large Generator Interconnection Agreement or its performance.

Optional Interconnection Study shall mean a sensitivity analysis based on assumptions specified by the Interconnection Customer in the Optional Interconnection Study Agreement.

Optional Interconnection Study Agreement shall mean the form of agreement contained in Appendix 5 of the Standard Large Generator Interconnection Procedures for conducting the Optional Interconnection Study.

Party or Parties shall mean the Transmission Owner, Interconnection Customer or any combination of the above.

Point of Change of Ownership shall mean the point, as set forth in Appendix A to the Standard Large Generator Interconnection Agreement, where the Interconnection Customer's

Interconnection Facilities connect to the Transmission Owner's Interconnection Facilities.

Point of Interconnection shall mean the point, as set forth in Appendix A to the Standard Large Generator Interconnection Agreement, where the Interconnection Facilities connect to the Transmission Owner's Transmission System.

Provisional Interconnection Service shall mean Interconnection Service approved by the ITO and provided by Transmission Owner associated with interconnecting the Interconnection Customer's Generating Facility to Transmission Owner's Transmission System and enabling that Transmission System to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Provisional Large Generator Interconnection Agreement and, if applicable, the Tariff.

Provisional Large Generator Interconnection Agreement shall mean the interconnection agreement for Provisional Interconnection Service established between the Transmission Owner and the Interconnection Customer. This agreement shall take the form of the Large Generator Interconnection Agreement, modified for provisional purposes.

Queue Position shall mean the order of a valid Generator Interconnection Request, relative to all other pending valid Generator Interconnection Requests, that is established based upon the date and time of receipt of the valid Generator Interconnection Request by the ITO.

Reasonable Efforts shall mean, with respect to an action required to be attempted or taken by a Party under the Standard Large Generator Interconnection Agreement, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

Reliability Coordinator shall mean the party charged with providing reliability coordination service for the Transmission Owner's system in accordance with Attachment P hereto.

Scoping Meeting shall mean the meeting between representatives of the Interconnection Customer, Transmission Owner, and ITO conducted for the purpose of discussing alternative interconnection options, to exchange information including any transmission data and earlier study evaluations that would be reasonably expected to impact such interconnection options, to analyze such information, and to determine the potential feasible Points of Interconnection.

Site Control shall mean documentation reasonably demonstrating: (1) ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing the Generating Facility; (2) an option to purchase or acquire a leasehold site for such purpose; or (3) an exclusivity or other business relationship between Interconnection Customer and the entity having the right to sell, lease or grant Interconnection Customer the right to possess or occupy a site for such purpose.

Small Generating Facility shall mean a Generating Facility that has a Generating Facility Capacity of no more than 20 MW.

Stand Alone Network Upgrades shall mean Network Upgrades that are not part of an Affected System that an Interconnection Customer may construct without affecting day-to-day

operations of the Transmission System during their construction. Both the Transmission Owner and the Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement. If the Transmission Owner and Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, the Transmission Owner must provide the Interconnection Customer a written technical explanation outlining why the Transmission Owner does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination.

Standard Large Generator Interconnection Agreement (LGIA) shall mean the form of interconnection agreement applicable to an Generator Interconnection Request pertaining to a Large Generating Facility that is included in the Transmission Owner's Tariff.

Standard Large Generator Interconnection Procedures (LGIP) shall mean the interconnection procedures applicable to an Generator Interconnection Request pertaining to a Large Generating Facility that are included in the Transmission Owner's Tariff.

Surplus Interconnection Service shall mean any unneeded portion of Interconnection Service established in a Large Generator Interconnection Agreement, such that if Surplus Interconnection Service is utilized the total amount of Interconnection Service at the Point of Interconnection would remain the same.

System Protection Facilities shall mean the equipment, including necessary protection signal communications equipment, required to protect (1) the Transmission Owner's Transmission System from faults or other electrical disturbances occurring at the Generating Facility and (2) the Generating Facility from faults or other electrical system disturbances occurring on the Transmission Owner's Transmission System or on other delivery systems or other generating systems to which the Transmission Owner's Transmission System is directly connected.

Tariff shall mean the Transmission Owner's Tariff through which open access transmission service and Interconnection Service are offered, as filed with FERC, and as amended or supplemented from time to time, or any successor tariff.

Transmission Owner shall mean LG&E/KU, the public utility operating companies.

Transmission Owner's Interconnection Facilities shall mean all facilities and equipment owned, controlled or operated by the Transmission Owner from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Transmission Owner's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Transmission System shall mean the facilities owned and operated by the Transmission Owner that are used to provide transmission service under Part II and Part III of the Transmission Owner's Tariff.

Trial Operation shall mean the period during which Interconnection Customer is

engaged in on-site test operations and commissioning of the Generating Facility prior to Commercial Operation.

Variable Energy Resource shall mean a device for the production of electricity that is characterized by an energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator.

Article 2. Effective Date, Term, and Termination

2.1 Effective Date.

This LGIA shall become effective upon execution by the Parties subject to acceptance by FERC (if applicable), or if filed unexecuted, upon the date specified by FERC. The Transmission Owner shall promptly file this LGIA with FERC upon execution in accordance with Article 3.1, if required.

2.2 Term of Agreement.

Subject to the provisions of Article 2.3, this LGIA shall remain in effect for a period of ten (10) years from the Effective Date or such other longer period as Interconnection Customer may request (Term to be specified in individual agreements) and shall be automatically renewed for each successive one-year period thereafter.

2.3 Termination Procedures.

2.3.1 Written Notice.

This LGIA may be terminated by Interconnection Customer after giving Transmission Owner ninety (90) Calendar Days advance written notice, or by the Transmission Owner notifying FERC after the Generating Facility permanently ceases Commercial Operation.

2.3.2 Default.

Any Party may terminate this LGIA in accordance with Article 17.

2.3.3 Notwithstanding Articles 2.3.1 and 2.3.2, no termination shall become effective until the Parties have complied with all Applicable Laws and Regulations applicable to such termination, including the filing with FERC of a notice of termination of this LGIA, which notice has been accepted for filing by FERC.

2.4 Termination Costs.

If a Party elects to terminate this Agreement pursuant to Article 2.3 above, each Party shall pay all costs incurred (including any cancellation costs relating to orders or contracts for Interconnection Facilities and equipment) or charges assessed by the other Party, as of the date of the other Party's receipt of such notice of termination, that are the responsibility of the Terminating Party under this LGIA. In the event of termination by a Party, the other Party shall use commercially Reasonable Efforts to mitigate the costs, damages and charges arising as a consequence of termination. Upon termination of this LGIA, unless otherwise ordered or approved by FERC:

2.4.1 With respect to any portion of Transmission Owner's Interconnection Facilities that have not yet been constructed or installed, Transmission

Owner shall to the extent possible and with Interconnection Customer's authorization cancel any pending orders of, or return, any materials or equipment for, or contracts for construction of, such facilities; provided that in the event Interconnection Customer elects not to authorize such cancellation, Interconnection Customer shall assume all payment obligations with respect to such materials, equipment, and contracts, and Transmission Owner shall deliver such material and equipment, and, if necessary, assign such contracts, to Interconnection Customer as soon as practicable, at Interconnection Customer's expense. To the extent that Interconnection Customer has already paid Transmission Owner for any or all such costs of materials or equipment not taken by Interconnection Customer, Transmission Owner shall promptly refund such amounts to Interconnection Customer, less any costs, including penalties incurred by Transmission Owner to cancel any pending orders of or return such materials, equipment, or contracts.

If an Interconnection Customer terminates this LGIA, it shall be responsible for all costs incurred in association with that Interconnection Customer's interconnection, including any cancellation costs relating to orders or contracts for Interconnection Facilities and equipment, and other expenses including any Network Upgrades for which Transmission Owner has incurred expenses and has not been reimbursed by Interconnection Customer.

2.4.2 Transmission Owner may, at its option, retain any portion of such materials, equipment, or facilities that Interconnection Customer chooses not to accept delivery of, in which case Transmission Owner shall be responsible for all costs associated with procuring such materials, equipment, or facilities.

2.4.3 With respect to any portion of the Interconnection Facilities, and any other facilities already installed or constructed pursuant to the terms of this LGIA, Interconnection Customer shall be responsible for all costs associated with the removal, relocation or other disposition or retirement of such materials, equipment, or facilities.

2.5 Disconnection.

Upon termination of this LGIA, the Parties will take all appropriate steps to disconnect the Large Generating Facility from the Transmission System. All costs required to effectuate such disconnection shall be borne by the terminating Party, unless such termination resulted from a non-terminating Party's Default of this LGIA or such non-terminating Party otherwise is responsible for these costs under this LGIA.

2.6 Survival.

This LGIA shall continue in effect after termination to the extent necessary to provide for final billings and payments and for costs incurred hereunder, including billings and payments pursuant to this LGIA; to permit the determination and enforcement of liability and indemnification obligations arising from acts or events that occurred while this LGIA was in effect; and to permit each Party to have access to the lands of the other Party pursuant to this LGIA or

other applicable agreements, to disconnect, remove or salvage its own facilities and equipment.

Article 3. Regulatory Filings

3.1 Filing.

The Transmission Owner shall file this LGIA (and any amendment hereto) with the appropriate Governmental Authority, if required. Interconnection Customer may request that any information so provided be subject to the confidentiality provisions of Article 22. If Interconnection Customer has executed this LGIA, or any amendment thereto, Interconnection Customer shall reasonably cooperate with Transmission Owner with respect to such filing and to provide any information reasonably requested by Transmission Owner needed to comply with applicable regulatory requirements.

Article 4. Scope of Service

4.1 Interconnection Product Options.

Interconnection Customer has selected the following (checked) type of Interconnection Service:

4.1.1 Energy Resource Interconnection Service.

4.1.1.1 The Product.

Energy Resource Interconnection Service allows Interconnection Customer to connect the Large Generating Facility to the Transmission System and be eligible to deliver the Large Generating Facility's output using the existing firm or non-firm capacity of the Transmission System on an "as available" basis. To the extent Interconnection Customer wants to receive Energy Resource Interconnection Service, Transmission Owner shall construct facilities identified in Attachment A.

4.1.1.2 Transmission Delivery Service Implications.

Under Energy Resource Interconnection Service, Interconnection Customer will be eligible to inject power from the Large Generating Facility into and deliver power across the interconnecting Transmission Owner's Transmission System on an "as available" basis up to the amount of MWs identified in the applicable stability and steady state studies to the extent the upgrades initially required to qualify for Energy Resource Interconnection Service have been constructed. Where eligible to do so (e.g., PJM, ISO-NE, NYISO), Interconnection Customer may place a bid to sell into the market up to the maximum identified Large Generating Facility output, subject to any conditions specified in the interconnection service approval, and the Large Generating Facility will be dispatched to the extent Interconnection Customer's bid clears. In all other instances, no transmission delivery

service from the Large Generating Facility is assured, but Interconnection Customer may obtain Point-to-Point Transmission Service, Network Integration Transmission Service, or be used for secondary network transmission service, pursuant to Transmission Owner's Tariff, up to the maximum output identified in the stability and steady state studies. In those instances, in order for Interconnection Customer to obtain the right to deliver or inject energy beyond the Large Generating Facility Point of Interconnection or to improve its ability to do so, transmission delivery service must be obtained pursuant to the provisions of Transmission Owner's Tariff. The Interconnection Customer's ability to inject its Large Generating Facility output beyond the Point of Interconnection, therefore, will depend on the existing capacity of Transmission Owner's Transmission System at such time as a transmission service request is made that would accommodate such delivery. The provision of firm Point-to-Point Transmission Service or Network Integration Transmission Service may require the construction of additional Network Upgrades.

4.1.2 Network Resource Interconnection Service.

4.1.2.1 The Product.

ITO must conduct the necessary studies in coordination with the Transmission Owner and the Transmission Owner must construct the Network Upgrades needed to integrate the Large Generating Facility (1) in a manner comparable to that in which Transmission Owner integrates its generating facilities to serve native load customers; or (2) in an ISO or RTO with market based congestion management, in the same manner as all Network Resources. To the extent Interconnection Customer wants to receive Network Resource Interconnection Service, Transmission Owner shall construct the facilities identified in Attachment A to this LGIA.

4.1.2.2 Transmission Delivery Service Implications.

Network Resource Interconnection Service allows Interconnection Customer's Large Generating Facility to be designated by any Network Customer under the Tariff on Transmission Owner's Transmission System as a Network Resource, up to the Large Generating Facility's full output, on the same basis as existing Network Resources interconnected to Transmission Owner's Transmission System, and to be studied as a Network Resource on the assumption that such a designation will occur. Although Network Resource Interconnection Service does not convey a reservation of transmission service, any Network Customer under the Tariff can utilize its network service

under the Tariff to obtain delivery of energy from the interconnected Interconnection Customer's Large Generating Facility in the same manner as it accesses Network Resources. A Large Generating Facility receiving Network Resource Interconnection Service may also be used to provide Ancillary Services after technical studies and/or periodic analyses are performed with respect to the Large Generating Facility's ability to provide any applicable Ancillary Services, provided that such studies and analyses have been or would be required in connection with the provision of such Ancillary Services by any existing Network Resource. However, if an Interconnection Customer's Large Generating Facility has not been designated as a Network Resource by any load, it cannot be required to provide Ancillary Services except to the extent such requirements extend to all generating facilities that are similarly situated. The provision of Network Integration Transmission Service or firm Point-to-Point Transmission Service may require additional studies and the construction of additional upgrades. Because such studies and upgrades would be associated with a request for delivery service under the Tariff, cost responsibility for the studies and upgrades would be in accordance with FERC's policy for pricing transmission delivery services. Network Resource Interconnection Service does not necessarily provide Interconnection Customer with the capability to physically deliver the output of its Large Generating Facility to any particular load on Transmission Owner's Transmission System without incurring congestion costs. In the event of transmission constraints on Transmission Owner's Transmission System, Interconnection Customer's Large Generating Facility shall be subject to the applicable congestion management procedures in Transmission Owner's Transmission System in the same manner as Network Resources. There is no requirement either at the time of study or interconnection, or at any point in the future, that Interconnection Customer's Large Generating Facility be designated as a Network Resource by a Network Service Customer under the Tariff or that Interconnection Customer identify a specific buyer (or sink). To the extent a Network Customer does designate the Large Generating Facility as a Network Resource, it must do so pursuant to Transmission Owner's Tariff. Once an Interconnection Customer satisfies the requirements for obtaining Network Resource Interconnection Service, any future transmission service request for delivery from the Large Generating Facility

within Transmission Owner's Transmission System of any amount of capacity and/or energy, up to the amount initially studied, will not require that any additional studies be performed or that any further upgrades associated with such Large Generating Facility be undertaken, regardless of whether or not such Large Generating Facility is ever designated by a Network Customer as a Network Resource and regardless of changes in ownership of the Large Generating Facility. However, the reduction or elimination of congestion or redispatch costs may require additional studies and the construction of additional upgrades.

To the extent Interconnection Customer enters into an arrangement for long term transmission service for deliveries from the Large Generating Facility outside Transmission Owner's Transmission System, such request may require additional studies and upgrades in order for ITO to grant such request.

4.2 Provision of Service.

The Transmission Owner shall provide Interconnection Service for the Large Generating Facility at the Point of Interconnection.

4.3 Performance Standards.

Each Party shall perform all of its obligations under this LGIA in accordance with Applicable Laws and Regulations, Applicable Reliability Standards, and Good Utility Practice, and to the extent a Party is required or prevented or limited in taking any action by such regulations and standards, such Party shall not be deemed to be in Breach of this LGIA for its compliance therewith. If such Party is a Transmission Owner, then that Party shall amend the LGIA and submit the amendment to FERC for approval.

4.4 No Transmission Delivery Service.

The execution of this LGIA does not constitute a request for, nor the provision of, any transmission delivery service under Transmission Owner's Tariff, and does not convey any right to deliver electricity to any specific customer or Point of Delivery.

4.5 Interconnection Customer Provided Services.

The services provided by Interconnection Customer under this LGIA are set forth in Article 9.6 and Article 13.5.1. Interconnection Customer shall be paid for such services in accordance with Article 11.6.

Article 5. Interconnection Facilities Engineering, Procurement, and Construction

5.1 Options.

Unless otherwise mutually agreed to between the Parties, Interconnection Customer shall select the In-Service Date, Initial Synchronization Date, and Commercial Operation Date; and either the Standard Option or Alternate Option,

and such dates and selected option shall be set forth in Appendix B, Milestones. At the same time, Interconnection Customer shall indicate whether it elects to exercise the Option to Build set forth in Article 5.1.3 below. If the dates designated by Interconnection Customer are not acceptable to Transmission Owner, Transmission Owner shall so notify Interconnection Customer within thirty (30) Calendar Days. Upon receipt of the notification that Interconnection Customer's designated dates are not acceptable to Transmission Owner, the Interconnection Customer shall notify Transmission Owner within thirty (30) Calendar Days whether it elects to exercise the Option to Build if it has not already elected to exercise the Option to Build.

5.1.1 Standard Option.

Transmission Owner shall design, procure, and construct Transmission Owner's Interconnection Facilities and Network Upgrades, using Reasonable Efforts to complete Transmission Owner's Interconnection Facilities and Network Upgrades by the dates set forth in Appendix B, Milestones. Transmission Owner shall not be required to undertake any action which is inconsistent with its standard safety practices, its material and equipment specifications, its design criteria and construction procedures, its labor agreements, and Applicable Laws and Regulations. In the event Transmission Owner reasonably expects that it will not be able to complete Transmission Owner's Interconnection Facilities and Network Upgrades by the specified dates, Transmission Owner shall promptly provide written notice to Interconnection Customer and shall undertake Reasonable Efforts to meet the earliest dates thereafter.

5.1.2 Alternate Option.

If the dates designated by Interconnection Customer are acceptable to the Transmission Owner, the Transmission Owner shall so notify Interconnection Customer within thirty (30) Calendar Days, and Transmission Owner shall assume responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities by the designated dates.

If Transmission Owner subsequently fails to complete Transmission Owner's Interconnection Facilities by the In-Service Date, to the extent necessary to provide back feed power; or fails to complete Network Upgrades by the Initial Synchronization Date to the extent necessary to allow for Trial Operation at full power output, unless other arrangements are made by the Parties for such Trial Operation; or fails to complete the Network Upgrades by the Commercial Operation Date, as such dates are reflected in Appendix B, Milestones; Transmission Owner shall pay Interconnection Customer liquidated damages in accordance with Article 5.3, Liquidated Damages, provided, however, the dates designated by Interconnection Customer shall be extended day for day for each day that any third party transmission provider refuses to grant clearances to install equipment.

5.1.3 Option to Build.

Interconnection Customer shall have the option to assume

responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades on the dates specified in Article 5.1.2.

Transmission Owner and Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify such Stand Alone Network Upgrades in Appendix A. Except for Stand Alone Network Upgrades, Interconnection Customer shall have no right to construct Network Upgrades under this option.

5.1.4 Negotiated Option.

If the dates designated by Interconnection Customer are not acceptable to Transmission Owner, the Parties shall in good faith attempt to negotiate terms and conditions (including revision of the specified dates and liquidated damages, the provision of incentives, or the procurement and construction of all facilities other than Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build under Article 5.1.3). If the Parties are unable to reach agreement on such terms and conditions, then, pursuant to Article 5.1.1 (Standard Option), Transmission Owner shall assume responsibility for the design, procurement and construction of all facilities other than Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build.

5.2 General Conditions Applicable to Option to Build.

If Interconnection Customer assumes responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades,

(1) Interconnection Customer shall engineer, procure equipment, and construct Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades (or portions thereof) using Good Utility Practice and using standards and specifications provided in advance by the Transmission Owner;

(2) Interconnection Customer's engineering, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades shall comply with all requirements of law to which Transmission Owner would be subject in the engineering, procurement or construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;

(3) Transmission Owner shall review and approve the engineering design, equipment acceptance tests, and the construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;

(4) prior to commencement of construction, Interconnection Customer shall provide to Transmission Owner with a schedule for construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades, and shall promptly respond to requests for information from Transmission Owner;

(5) at any time during construction, Transmission Owner shall have the right to gain unrestricted access to Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades and to conduct inspections of the same;

- (6) at any time during construction, should any phase of the engineering, equipment procurement, or construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades not meet the standards and specifications provided by Transmission Owner, Interconnection Customer shall be obligated to remedy deficiencies in that portion of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades;
- (7) Interconnection Customer shall indemnify Transmission Owner for claims arising from Interconnection Customer's construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades under the terms and procedures applicable to Article 18.1 Indemnity;
- (8) Interconnection Customer shall transfer control of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades to Transmission Owner;
- (9) Unless Parties otherwise agree, Interconnection Customer shall transfer ownership of Transmission Owner's Interconnection Facilities and Stand-Alone Network Upgrades to Transmission Owner;
- (10) Transmission Owner shall approve and accept for operation and maintenance Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades to the extent engineered, procured, and constructed in accordance with this Article 5.2; and
- (11) Interconnection Customer shall deliver to Transmission Owner "as-built" drawings, information, and any other documents that are reasonably required by Transmission Owner to assure that the Interconnection Facilities and Stand-Alone Network Upgrades are built to the standards and specifications required by Transmission Owner.
- (12) If Interconnection Customer exercises the Option to Build pursuant to Article 5.1.3, Interconnection Customer shall pay Transmission Owner the agreed upon amount of [\$ PLACEHOLDER] for Transmission Owner to execute the responsibilities enumerated to Transmission Owner under Article 5.2. Transmission Owner shall invoice Interconnection Customer for this total amount to be divided on a monthly basis pursuant to Article 12.

5.3 Liquidated Damages.

The actual damages to Interconnection Customer, in the event Transmission Owner's Interconnection Facilities or Network Upgrades are not completed by the dates designated by Interconnection Customer and accepted by Transmission Owner pursuant to subparagraphs 5.1.2 or 5.1.4, above, may include Interconnection Customer's fixed operation and maintenance costs and lost opportunity costs. Such actual damages are uncertain and impossible to determine at this time. Because of such uncertainty, any liquidated damages paid by Transmission Owner to Interconnection Customer in the event that Transmission Owner does not complete any portion of Transmission Owner's Interconnection Facilities or Network Upgrades by the applicable dates, shall be an amount equal to ½ of 1 percent per day of the actual cost of Transmission Owner's Interconnection Facilities and Network Upgrades, in the aggregate, for which Transmission Owner has assumed responsibility to design, procure and construct.

However, in no event shall the total liquidated damages exceed 20 percent of the

actual cost of Transmission Owner's Interconnection Facilities and Network Upgrades for which Transmission Owner has assumed responsibility to design, procure, and construct. The foregoing payments will be made by Transmission Owner to Interconnection Customer as just compensation for the damages caused to Interconnection Customer, which actual damages are uncertain and impossible to determine at this time, and as reasonable liquidated damages, but not as a penalty or a method to secure performance of this LGIA. Liquidated damages, when the Parties agree to them, are the exclusive remedy for the Transmission Owner's failure to meet its schedule.

No liquidated damages shall be paid to Interconnection Customer if: (1) Interconnection Customer is not ready to commence use of Transmission Owner's Interconnection Facilities or Network Upgrades to take the delivery of power for the Large Generating Facility's Trial Operation or to export power from the Large Generating Facility on the specified dates, unless Interconnection Customer would have been able to commence use of Transmission Owner's Interconnection Facilities or Network Upgrades to take the delivery of power for Large Generating Facility's Trial Operation or to export power from the Large Generating Facility, but for Transmission Owner's delay; (2) Transmission Owner's failure to meet the specified dates is the result of the action or inaction of Interconnection Customer or any other Interconnection Customer who has entered into an LGIA with Transmission Owner or any cause beyond Transmission Owner's reasonable control or reasonable ability to cure; (3) the Interconnection Customer has assumed responsibility for the design, procurement and construction of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades; or (4) the Parties have otherwise agreed.

5.4 Power System Stabilizers.

The Interconnection Customer shall procure, install, maintain and operate Power System Stabilizers in accordance with the guidelines and procedures established by the Applicable Reliability Council. Transmission Owner reserves the right to reasonably establish minimum acceptable settings for any installed Power System Stabilizers, subject to the design and operating limitations of the Large Generating Facility. If the Large Generating Facility's Power System Stabilizers are removed from service or not capable of automatic operation, Interconnection Customer shall immediately notify the Transmission Owner. The requirements of this paragraph shall not apply to wind generators.

5.5 Equipment Procurement.

If responsibility for construction of Transmission Owner's Interconnection Facilities or Network Upgrades is to be borne by Transmission Owner, then Transmission Owner shall commence design of Transmission Owner's Interconnection Facilities or Network Upgrades and procure necessary equipment as soon as practicable after all of the following conditions are satisfied, unless the Parties otherwise agree in writing:

- 5.5.1** Transmission Owner has completed the Facilities Study pursuant to the Facilities Study Agreement;
- 5.5.2** Transmission Owner has received written authorization to proceed with design and procurement from Interconnection Customer by the date specified in Appendix B, Milestones; and

5.5.3 Interconnection Customer has provided security to Transmission Owner in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.6 Construction Commencement.

Transmission Owner shall commence construction of Transmission Owner's Interconnection Facilities and Network Upgrades for which it is responsible as soon as practicable after the following additional conditions are satisfied:

5.6.1 Approval of the appropriate Governmental Authority has been obtained for any facilities requiring regulatory approval;

5.6.2 Necessary real property rights and rights-of-way have been obtained, to the extent required for the construction of a discrete aspect of Transmission Owner's Interconnection Facilities and Network Upgrades;

5.6.3 The Transmission Owner has received written authorization to proceed with construction from Interconnection Customer by the date specified in Appendix B, Milestones; and

5.6.4 Interconnection Customer has provided security to Transmission Owner in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.7 Work Progress.

The Parties will keep each other advised periodically as to the progress of their respective design, procurement and construction efforts. Either Party may, at any time, request a progress report from the other Party. If, at any time, Interconnection Customer determines that the completion of Transmission Owner's Interconnection Facilities will not be required until after the specified In-Service Date, Interconnection Customer will provide written notice to Transmission Owner of such later date upon which the completion of Transmission Owner's Interconnection Facilities will be required.

5.8 Information Exchange.

As soon as reasonably practicable after the Effective Date, the Parties shall exchange information regarding the design and compatibility of the Parties' Interconnection Facilities and compatibility of the Interconnection Facilities with Transmission Owner's Transmission System, and shall work diligently and in good faith to make any necessary design changes.

5.9 Other Interconnection Options.

If any of Transmission Owner's Interconnection Facilities or Network Upgrades are not reasonably expected to be completed prior to the Commercial Operation Date of the Large Generating Facility, Transmission Owner shall, upon the request and at the expense of Interconnection Customer, perform operating studies on a timely basis to determine the extent to which the Large Generating Facility and Interconnection Customer's Interconnection Facilities may operate prior to the completion of Transmission Owner's Interconnection Facilities or Network Upgrades consistent with Applicable Laws and Regulations, Applicable Reliability Standards, Good Utility Practice, and this LGIA. Transmission Owner shall permit Interconnection Customer to operate the Large Generating Facility and Interconnection Customer's Interconnection Facilities in accordance

with the results of such studies.

5.9.1 Limited Operation.

5.9.2 Provisional Interconnection Service. Upon the request of Interconnection Customer, and prior to completion of requisite Interconnection Facilities, Network Upgrades, Distribution Upgrades, or System Protection Facilities Transmission Owner may execute a Provisional Large Generator Interconnection Agreement or Interconnection Customer may request the filing of an unexecuted Provisional Large Generator Interconnection Agreement with the Interconnection Customer for limited Interconnection Service at the discretion of Transmission Owner based upon an evaluation that will consider the results of available studies. The ITO shall determine, through available studies or additional studies as necessary, whether stability, short circuit, thermal, and/or voltage issues would arise if Interconnection Customer interconnects without modifications to the Generating Facility or Transmission System. The ITO, in consultation with the Transmission Owner, shall determine whether any Interconnection Facilities, Network Upgrades, Distribution Upgrades, or System Protection Facilities that are necessary to meet the requirements of NERC, or any applicable Regional Entity for the interconnection of a new, modified and/or expanded Generating Facility are in place prior to the commencement of Interconnection Service from the Generating Facility. Where available studies indicate that such, Interconnection Facilities, Network Upgrades, Distribution Upgrades, and/or System Protection Facilities that are required for the interconnection of a new, modified and/or expanded Generating Facility are not currently in place, the ITO will perform a study, at the Interconnection Customer's expense, to confirm the facilities that are required for Provisional Interconnection Service. The maximum permissible output of the Generating Facility in the Provisional Large Generator Interconnection Agreement shall be studied and updated annually and at the Interconnection Customer's expense. Interconnection Customer assumes all risk and liabilities with respect to changes between the Provisional Large Generator Interconnection Agreement and the Large Generator Interconnection Agreement, including changes in output limits and Interconnection Facilities, Network Upgrades, Distribution Upgrades, and/or System Protection Facilities cost responsibilities.

5.10 Interconnection Customer's Interconnection Facilities ('ICIF').

Interconnection Customer shall, at its expense, design, procure, construct, own and install the ICIF, as set forth in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades.

5.10.1 Interconnection Customer's Interconnection Facility Specifications.

Interconnection Customer shall submit initial specifications for the ICIF, including System Protection Facilities, to Transmission Owner at least one hundred eighty (180) Calendar Days prior to the Initial Synchronization Date; and final specifications for review and comment at least ninety (90) Calendar Days prior to the Initial

Synchronization Date. Transmission Owner shall review such specifications to ensure that the ICIF are compatible with the technical specifications, operational control, and safety requirements of Transmission Owner and comment on such specifications within thirty (30) Calendar Days of Interconnection Customer's submission. All specifications provided hereunder shall be deemed confidential.

5.10.2 Transmission Owner's Review.

Transmission Owner's review of Interconnection Customer's final specifications shall not be construed as confirming, endorsing, or providing a warranty as to the design, fitness, safety, durability or reliability of the Large Generating Facility, or the ICIF.

Interconnection Customer shall make such changes to the ICIF as may reasonably be required by Transmission Owner, in accordance with Good Utility Practice, to ensure that the ICIF are compatible with the technical specifications, operational control, and safety requirements of Transmission Owner.

5.10.3 ICIF Construction.

The ICIF shall be designed and constructed in accordance with Good Utility Practice. Within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Parties agree on another mutually acceptable deadline, Interconnection Customer shall deliver to Transmission Owner "as-built" drawings, information and documents for the ICIF, such as: a one-line diagram, a site plan showing the Large Generating Facility and the ICIF, plan and elevation drawings showing the layout of the ICIF, a relay functional diagram, relaying AC and DC schematic wiring diagrams and relay settings for all facilities associated with Interconnection Customer's step-up transformers, the facilities connecting the Large Generating Facility to the step-up transformers and the ICIF, and the impedances (determined by factory tests) for the associated step-up transformers and the Large Generating Facility. The Interconnection Customer shall provide Transmission Owner specifications for the excitation system, automatic voltage regulator, Large Generating Facility control and protection settings, transformer tap settings, and communications, if applicable.

5.11 Transmission Owner's Interconnection Facilities Construction.

Transmission Owner's Interconnection Facilities shall be designed and constructed in accordance with Good Utility Practice. Upon request, within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Parties agree on another mutually acceptable deadline, Transmission Owner shall deliver to Interconnection Customer the following "as-built" drawings, information and documents for Transmission Owner's Interconnection Facilities [include appropriate drawings and relay diagrams].

Transmission Owner will obtain control of Transmission Owner's Interconnection Facilities and Stand Alone Network Upgrades upon completion of such facilities.

5.12 Access Rights.

Upon reasonable notice and supervision by a Party, and subject to any required or

necessary regulatory approvals, a Party ("Granting Party") shall furnish at no cost to the other Party ("Access Party") any rights of use, licenses, rights of way and easements with respect to lands owned or controlled by the Granting Party, its agents (if allowed under the applicable agency agreement), or any Affiliate, that are necessary to enable the Access Party to obtain ingress and egress to construct, operate, maintain, repair, test (or witness testing), inspect, replace or remove facilities and equipment to: (i) interconnect the Large Generating Facility with the Transmission System; (ii) operate and maintain the Large Generating Facility, the Interconnection Facilities and the Transmission System; and (iii) disconnect or remove the Access Party's facilities and equipment upon termination of this LGIA. In exercising such licenses, rights of way and easements, the Access Party shall not unreasonably disrupt or interfere with normal operation of the Granting Party's business and shall adhere to the safety rules and procedures established in advance, as may be changed from time to time, by the Granting Party and provided to the Access Party.

5.13 Lands of Other Property Owners.

If any part of Transmission Owner's Interconnection Facilities and/or Network Upgrades is to be installed on property owned by persons other than Interconnection Customer or Transmission Owner, Transmission Owner shall at Interconnection Customer's expense use efforts, similar in nature and extent to those that it typically undertakes on its own behalf or on behalf of its Affiliates, including use of its eminent domain authority, and to the extent consistent with state law, to procure from such persons any rights of use, licenses, rights of way and easements that are necessary to construct, operate, maintain, test, inspect, replace or remove Transmission Owner's Interconnection Facilities and/or Network Upgrades upon such property.

5.14 Permits.

Transmission Owner and Interconnection Customer shall cooperate with each other in good faith in obtaining all permits, licenses, and authorizations that are necessary to accomplish the interconnection in compliance with Applicable Laws and Regulations. With respect to this paragraph, Transmission Owner shall provide permitting assistance to Interconnection Customer comparable to that provided to Transmission Owner's own, or an Affiliate's generation.

5.15 Early Construction of Base Case Facilities.

Interconnection Customer may request Transmission Owner to construct, and Transmission Owner shall construct, using Reasonable Efforts to accommodate Interconnection Customer's In-Service Date, all or any portion of any Network Upgrades required for Interconnection Customer to be interconnected to the Transmission System which are included in the Base Case of the Facilities Study for Interconnection Customer, and which also are required to be constructed for another Interconnection Customer, but where such construction is not scheduled to be completed in time to achieve Interconnection Customer's In-Service Date.

5.16 Suspension.

Interconnection Customer reserves the right, upon written notice to Transmission Owner, to suspend at any time all work by Transmission Owner associated with the construction and installation of Transmission Owner's Interconnection

Facilities and/or Network Upgrades required under this LGIA with the condition that Transmission System shall be left in a safe and reliable condition in accordance with Good Utility Practice and Transmission Owner's safety and reliability criteria. In such event, Interconnection Customer shall be responsible for all reasonable and necessary costs which Transmission Owner (i) has incurred pursuant to this LGIA prior to the suspension and (ii) incurs in suspending such work, including any costs incurred to perform such work as may be necessary to ensure the safety of persons and property and the integrity of the Transmission System during such suspension and, if applicable, any costs incurred in connection with the cancellation or suspension of material, equipment and labor contracts which Transmission Owner cannot reasonably avoid; provided, however, that prior to canceling or suspending any such material, equipment or labor contract, Transmission Owner shall obtain Interconnection Customer's authorization to do so.

The Transmission Owner shall invoice Interconnection Customer for such costs pursuant to Article 12 and Transmission Owner shall use due diligence to minimize its costs. In the event Interconnection Customer suspends work by Transmission Owner required under this LGIA pursuant to this Article 5.16, and has not requested Transmission Owner to recommence the work required under this LGIA on or before the expiration of three (3) years following commencement of such suspension, this LGIA shall be deemed terminated. The three-year period shall begin on the date the suspension is requested, or the date of the written notice to Transmission Owner, if no effective date is specified.

5.17 Taxes.

5.17.1 Interconnection Customer Payments Not Taxable.

The Parties intend that all payments or property transfers made by Interconnection Customer to Transmission Owner for the installation of Transmission Owner's Interconnection Facilities and the Network Upgrades shall be non-taxable, either as contributions to capital, or as an advance, in accordance with the Internal Revenue Code and any applicable state income tax laws and shall not be taxable as contributions in aid of construction or otherwise under the Internal Revenue Code and any applicable state income tax laws.

5.17.2 Representations and Covenants.

In accordance with IRS Notice 2001-82 and IRS Notice 88-129, Interconnection Customer represents and covenants that (i) ownership of the electricity generated at the Large Generating Facility will pass to another party prior to the transmission of the electricity on the Transmission System, (ii) for income tax purposes, the amount of any payments and the cost of any property transferred to Transmission Owner for Transmission Owner's Interconnection Facilities will be capitalized by Interconnection Customer as an intangible asset and recovered using the straight-line method over a useful life of twenty (20) years, and (iii) any portion of Transmission Owner's Interconnection Facilities that is a "dual-use intertie," within the meaning of IRS Notice 88-129, is reasonably expected to carry only a de minimis amount of electricity in the direction of the Large

Generating Facility. For this purpose, "de minimis amount" means no more than 5 percent of the total power flows in both directions, calculated in accordance with the "5 percent test" set forth in IRS Notice 88-129. This is not intended to be an exclusive list of the relevant conditions that must be met to conform to IRS requirements for nontaxable treatment.

At Transmission Owner's request, Interconnection Customer shall provide Transmission Owner with a report from an independent engineer confirming its representation in clause (iii), above.

Transmission Owner represents and covenants that the cost of Transmission Owner's Interconnection Facilities paid for by Interconnection Customer will have no net effect on the base upon which rates are determined.

The foregoing representations and covenants are required and made only if there are payments or property transfers made by Interconnection Customer to Transmission Owner for the installation of Transmission Owner's Interconnection Facilities or Network Upgrades.

5.17.3 Indemnification for the Cost Consequences of Current Tax Liability Imposed Upon the Transmission Owner.

Notwithstanding Article 5.17.1, Interconnection Customer shall protect, indemnify and hold harmless Transmission Owner from the cost consequences of any current tax liability imposed against Transmission Owner as the result of payments or property transfers made by Interconnection Customer to Transmission Owner under this LGIA for Interconnection Facilities, as well as any interest and penalties, other than interest and penalties attributable to any delay caused by Transmission Owner.

Transmission Owner shall not include a gross-up for the cost consequences of any current tax liability in the amounts it charges Interconnection Customer under this LGIA unless (i) Transmission Owner has determined, in good faith, that the payments or property transfers made by Interconnection Customer to Transmission Owner should be reported as income subject to taxation or (ii) any Governmental Authority directs Transmission Owner to report payments or property as income subject to taxation; provided, however, that Transmission Owner may require Interconnection Customer to provide security for Interconnection Facilities, in a form reasonably acceptable to Transmission Owner (such as a parental guarantee or a letter of credit), in an amount equal to the cost consequences of any current tax liability under this Article 5.17.

Interconnection Customer shall reimburse Transmission Owner for such costs on a fully grossed-up basis, in accordance with Article 5.17.4, within thirty (30) Calendar Days of receiving written notification from Transmission Owner of the amount due, including detail about how the amount was calculated.

The indemnification obligation shall terminate at the earlier of (1) the expiration of the ten year testing period and the applicable statute of

limitation, as it may be extended by Transmission Owner upon request of the IRS, to keep these years open for audit or adjustment, or (2) the occurrence of a subsequent taxable event and the payment of any related indemnification obligations as contemplated by this Article 5.17.

5.17.4 Tax Gross-Up Amount.

Interconnection Customer's liability for the cost consequences of any current tax liability under this Article 5.17 shall be calculated on a fully grossed-up basis. Except as may otherwise be agreed to by the Parties, this means that Interconnection Customer will pay Transmission Owner, in addition to the amount paid for the Interconnection Facilities and Network Upgrades, an amount equal to (1) the current taxes imposed on Transmission Owner ("Current Taxes") on the excess of (a) the gross income realized by Transmission Owner as a result of payments or property transfers made by Interconnection Customer to Transmission Owner under this LGIA (without regard to any payments under this Article 5.17) (the "Gross Income Amount") over (b) the present value of future tax deductions for depreciation that will be available as a result of such payments or property transfers (the "Present Value Depreciation Amount"), plus (2) an additional amount sufficient to permit Transmission Owner to receive and retain, after the payment of all Current Taxes, an amount equal to the net amount described in clause (1).

For this purpose, (i) Current Taxes shall be computed based on Transmission Owner's composite federal and state tax rates at the time the payments or property transfers are received and Transmission Owner will be treated as being subject to tax at the highest marginal rates in effect at that time (the "Current Tax Rate"), and (ii) the Present Value Depreciation Amount shall be computed by discounting Transmission Owner's anticipated tax depreciation deductions as a result of such payments or property transfers by Transmission Owner's current weighted average cost of capital. Thus, the formula for calculating Interconnection Customer's liability to Transmission Owner pursuant to this Article 5.17.4 can be expressed as follows: $(\text{Current Tax Rate} \times (\text{Gross Income Amount} - \text{Present Value of Tax Depreciation})) / (1 - \text{Current Tax Rate})$. Interconnection Customer's estimated tax liability in the event taxes are imposed shall be stated in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades.

5.17.5 Private Letter Ruling or Change or Clarification of Law.

At Interconnection Customer's request and expense, Transmission Owner shall file with the IRS a request for a private letter ruling as to whether any property transferred or sums paid, or to be paid, by Interconnection Customer to Transmission Owner under this LGIA are subject to federal income taxation. Interconnection Customer will prepare the initial draft of the request for a private letter ruling, and will certify under penalties of perjury that all facts represented in such request are true and accurate to the best of Interconnection Customer's

knowledge. Transmission Owner and Interconnection Customer shall cooperate in good faith with respect to the submission of such request. Transmission Owner shall keep Interconnection Customer fully informed of the status of such request for a private letter ruling and shall execute either a privacy act waiver or a limited power of attorney, in a form acceptable to the IRS that authorizes Interconnection Customer to participate in all discussions with the IRS regarding such request for a private letter ruling. Transmission Owner shall allow Interconnection Customer to attend all meetings with IRS officials about the request and shall permit Interconnection Customer to prepare the initial drafts of any follow-up letters in connection with the request.

5.17.6 Subsequent Taxable Events.

If, within 10 years from the date on which the relevant Transmission Owner's Interconnection Facilities are placed in service, (i) Interconnection Customer Breaches the covenants contained in Article 5.17.2, (ii) a "disqualification event" occurs within the meaning of IRS Notice 88-129, or (iii) this LGIA terminates and Transmission Owner retains ownership of the Interconnection Facilities and Network Upgrades, Interconnection Customer shall pay a tax gross-up for the cost consequences of any current tax liability imposed on Transmission Owner, calculated using the methodology described in Article 5.17.4 and in accordance with IRS Notice 90-60.

5.17.7 Contests.

In the event any Governmental Authority determines that Transmission Owner's receipt of payments or property constitutes income that is subject to taxation, Transmission Owner shall notify Interconnection Customer, in writing, within thirty (30) Calendar Days of receiving notification of such determination by a Governmental Authority. Upon the timely written request by Interconnection Customer and at Interconnection Customer's sole expense, Transmission Owner may appeal, protest, seek abatement of, or otherwise oppose such determination. Upon Interconnection Customer's written request and sole expense, Transmission Owner may file a claim for refund with respect to any taxes paid under this Article 5.17, whether or not it has received such a determination. Transmission Owner reserves the right to make all decisions with regard to the prosecution of such appeal, protest, abatement or other contest, including the selection of counsel and compromise or settlement of the claim, but Transmission Owner shall keep Interconnection Customer informed, shall consider in good faith suggestions from Interconnection Customer about the conduct of the contest, and shall reasonably permit Interconnection Customer or an Interconnection Customer representative to attend contest proceedings. Interconnection Customer shall pay to Transmission Owner on a periodic basis, as invoiced by Transmission Owner, Transmission Owner's documented reasonable costs of prosecuting such appeal, protest, abatement or other contest. At any time during the contest,

Transmission Owner may agree to a settlement either with Interconnection Customer's consent or after obtaining written advice from nationally-recognized tax counsel, selected by Transmission Owner, but reasonably acceptable to Interconnection Customer, that the proposed settlement represents a reasonable settlement given the hazards of litigation. Interconnection Customer's obligation shall be based on the amount of the settlement agreed to by Interconnection Customer, or if a higher amount, so much of the settlement that is supported by the written advice from nationally recognized tax counsel selected under the terms of the preceding sentence. The settlement amount shall be calculated on a fully grossed-up basis to cover any related cost consequences of the current tax liability. Any settlement without Interconnection Customer's consent or such written advice will relieve Interconnection Customer from any obligation to indemnify Transmission Owner for the tax at issue in the contest.

5.17.8 Refund.

In the event that (a) a private letter ruling is issued to Transmission Owner which holds that any amount paid or the value of any property transferred by Interconnection Customer to Transmission Owner under the terms of this LGIA is not subject to federal income taxation, (b) any legislative change or administrative announcement, notice, ruling or other determination makes it reasonably clear to Transmission Owner in good faith that any amount paid or the value of any property transferred by Interconnection Customer to Transmission Owner under the terms of this LGIA is not taxable to Transmission Owner, (c) any abatement, appeal, protest, or other contest results in a determination that any payments or transfers made by Interconnection Customer to Transmission Owner are not subject to federal income tax, or (d) if Transmission Owner receives a refund from any taxing authority for any overpayment of tax attributable to any payment or property transfer made by Interconnection Customer to Transmission Owner pursuant to this LGIA, Transmission Owner shall promptly refund to Interconnection Customer the following:

- (i) any payment made by Interconnection Customer under this Article 5.17 for taxes that is attributable to the amount determined to be non-taxable, together with interest thereon,
- (ii) interest on any amounts paid by Interconnection Customer to Transmission Owner for such taxes which Transmission Owner did not submit to the taxing authority, calculated in accordance with the methodology set forth in FERC's regulations at 18 CFR §35.19a(a)(2)(iii) from the date payment was made by Interconnection Customer to the date Transmission Owner refunds such payment to Interconnection Customer, and
- (iii) with respect to any such taxes paid by Transmission Owner, any refund or credit Transmission Owner receives or to which it may be entitled from any Governmental Authority, interest (or that portion thereof attributable to the payment described in clause (i), above) owed to Transmission Owner for such overpayment of taxes

(including any reduction in interest otherwise payable by Transmission Owner to any Governmental Authority resulting from an offset or credit); provided, however, that Transmission Owner will remit such amount promptly to Interconnection Customer only after and to the extent that Transmission Owner has received a tax refund, credit or offset from any Governmental Authority for any applicable overpayment of income tax related to Transmission Owner's Interconnection Facilities.

The intent of this provision is to leave the Parties, to the extent practicable, in the event that no taxes are due with respect to any payment for Interconnection Facilities and Network Upgrades hereunder, in the same position they would have been in had no such tax payments been made.

5.17.9 Taxes Other Than Income Taxes.

Upon the timely request by Interconnection Customer, and at Interconnection Customer's sole expense, Transmission Owner may appeal, protest, seek abatement of, or otherwise contest any tax (other than federal or state income tax) asserted or assessed against Transmission Owner for which Interconnection Customer may be required to reimburse Transmission Owner under the terms of this LGIA. Interconnection Customer shall pay to Transmission Owner on a periodic basis, as invoiced by Transmission Owner, Transmission Owner's documented reasonable costs of prosecuting such appeal, protest, abatement, or other contest. Interconnection Customer and Transmission Owner shall cooperate in good faith with respect to any such contest. Unless the payment of such taxes is a prerequisite to an appeal or abatement or cannot be deferred, no amount shall be payable by Interconnection Customer to Transmission Owner for such taxes until they are assessed by a final, non-appealable order by any court or agency of competent jurisdiction. In the event that a tax payment is withheld and ultimately due and payable after appeal, Interconnection Customer will be responsible for all taxes, interest and penalties, other than penalties attributable to any delay caused by Transmission Owner.

5.18 Tax Status.

Each Party shall cooperate with the other to maintain the other Party's tax status. Nothing in this LGIA is intended to adversely affect any Transmission Owner's tax exempt status with respect to the issuance of bonds including, but not limited to, Local Furnishing Bonds.

5.19 Modification.

5.19.1 General.

Each Party may undertake modifications to its facilities. If a Party plans to undertake a modification that reasonably may be expected to affect the other Party's facilities, that Party shall provide to the other Party sufficient information regarding such modification so that the other Party may evaluate the potential impact of such modification prior to commencement of the work. Such information shall be

deemed to be confidential hereunder and shall include information concerning the timing of such modifications and whether such modifications are expected to interrupt the flow of electricity from the Large Generating Facility. The Party desiring to perform such work shall provide the relevant drawings, plans, and specifications to the other Party at least ninety (90) Calendar Days in advance of the commencement of the work or such shorter period upon which the Parties may agree, which agreement shall not unreasonably be withheld, conditioned or delayed.

In the case of Large Generating Facility modifications that do not require Interconnection Customer to submit an Generator Interconnection Request, Transmission Owner shall provide to the Interconnection Customer, within thirty (30) Calendar Days (or such other time as the Parties may agree), an estimate of any additional modifications to the Transmission System, Transmission Owner's Interconnection Facilities or Network Upgrades necessitated by such Interconnection Customer modification and a good faith estimate of the costs thereof.

5.19.2 Standards.

Any additions, modifications, or replacements made to a Party's facilities shall be designed, constructed and operated in accordance with this LGIA and Good Utility Practice.

5.19.3 Modification Costs.

Interconnection Customer shall not be directly assigned for the costs of any additions, modifications, or replacements that Transmission Owner makes to Transmission Owner's Interconnection Facilities or the Transmission System to facilitate the interconnection of a third party to Transmission Owner's Interconnection Facilities or the Transmission System, or to provide transmission service to a third party under Transmission Owner's Tariff. Interconnection Customer shall be responsible for the costs of any additions, modifications, or replacements to Interconnection Customer's Interconnection Facilities that may be necessary to maintain or upgrade such Interconnection Customer's Interconnection Facilities consistent with Applicable Laws and Regulations, Applicable Reliability Standards or Good Utility Practice.

Article 6. Testing and Inspection

6.1 Pre-Commercial Operation Date Testing and Modifications.

Prior to the Commercial Operation Date, Transmission Owner shall test Transmission Owner's Interconnection Facilities and Network Upgrades and Interconnection Customer shall test the Large Generating Facility and Interconnection Customer's Interconnection Facilities to ensure their safe and reliable operation. Similar testing may be required after initial operation. Each Party shall make any modifications to its facilities that are found to be necessary as a result of such testing. Interconnection Customer shall bear the cost of all

such testing and modifications. Interconnection Customer shall generate test energy at the Large Generating Facility only if it has arranged for the delivery of such test energy.

6.2 Post-Commercial Operation Date Testing and Modifications.

Each Party shall at its own expense perform routine inspection and testing of its facilities and equipment in accordance with Good Utility Practice as may be necessary to ensure the continued interconnection of the Large Generating Facility with the Transmission System in a safe and reliable manner. Each Party shall have the right, upon advance written notice, to require reasonable additional testing of the other Party's facilities, at the requesting Party's expense, as may be in accordance with Good Utility Practice.

6.3 Right to Observe Testing.

Each Party shall notify the other Party in advance of its performance of tests of its Interconnection Facilities. The other Party has the right, at its own expense, to observe such testing.

6.4 Right to Inspect.

Each Party shall have the right, but shall have no obligation to: (i) observe the other Party's tests and/or inspection of any of its System Protection Facilities and other protective equipment, including Power System Stabilizers; (ii) review the settings of the other Party's System Protection Facilities and other protective equipment; and (iii) review the other Party's maintenance records relative to the Interconnection Facilities, the System Protection Facilities and other protective equipment. A Party may exercise these rights from time to time as it deems necessary upon reasonable notice to the other Party. The exercise or nonexercise by a Party of any such rights shall not be construed as an endorsement or confirmation of any element or condition of the Interconnection Facilities or the System Protection Facilities or other protective equipment or the operation thereof, or as a warranty as to the fitness, safety, desirability, or reliability of same. Any information that a Party obtains through the exercise of any of its rights under this Article 6.4 shall be deemed to be Confidential Information and treated pursuant to Article 22 of this LGIA.

Article 7. Metering

7.1 General.

Each Party shall comply with the Applicable Reliability Council requirements. Unless otherwise agreed by the Parties, Transmission Owner shall install Metering Equipment at the Point of Interconnection prior to any operation of the Large Generating Facility and shall own, operate, test and maintain such Metering Equipment. Power flows to and from the Large Generating Facility shall be measured at or, at Transmission Owner's option, compensated to, the Point of Interconnection. Transmission Owner shall provide metering quantities, in analog and/or digital form, to Interconnection Customer upon request. Interconnection Customer shall bear all reasonable documented costs associated with the purchase, installation, operation, testing and maintenance of the Metering Equipment.

7.2 Check Meters.

Interconnection Customer, at its option and expense, may install and operate, on its premises and on its side of the Point of Interconnection, one or more check meters to check Transmission Owner's meters. Such check meters shall be for check purposes only and shall not be used for the measurement of power flows for purposes of this LGIA, except as provided in Article 7.4 below. The check meters shall be subject at all reasonable times to inspection and examination by Transmission Owner or its designee. The installation, operation and maintenance thereof shall be performed entirely by Interconnection Customer in accordance with Good Utility Practice.

7.3 Standards.

The Transmission Owner shall install, calibrate, and test revenue quality Metering Equipment in accordance with applicable ANSI standards.

7.4 Testing of Metering Equipment.

The Transmission Owner shall inspect and test all Transmission Owner-owned Metering Equipment upon installation and at least once every two (2) years thereafter. If requested to do so by Interconnection Customer, Transmission Owner shall, at Interconnection Customer's expense, inspect or test Metering Equipment more frequently than every two (2) years. Transmission Owner shall give reasonable notice of the time when any inspection or test shall take place, and Interconnection Customer may have representatives present at the test or inspection. If at any time Metering Equipment is found to be inaccurate or defective, it shall be adjusted, repaired or replaced at Interconnection Customer's expense, in order to provide accurate metering, unless the inaccuracy or defect is due to Transmission Owner's failure to maintain, then Transmission Owner shall pay. If Metering Equipment fails to register, or if the measurement made by Metering Equipment during a test varies by more than two percent from the measurement made by the standard meter used in the test, Transmission Owner shall adjust the measurements by correcting all measurements for the period during which Metering Equipment was in error by using Interconnection Customer's check meters, if installed. If no such check meters are installed or if the period cannot be reasonably ascertained, the adjustment shall be for the period immediately preceding the test of the Metering Equipment equal to one-half the time from the date of the last previous test of the Metering Equipment.

7.5 Metering Data.

At Interconnection Customer's expense, the metered data shall be telemetered to one or more locations designated by Transmission Owner and one or more locations designated by Interconnection Customer. Such telemetered data shall be used, under normal operating conditions, as the official measurement of the amount of energy delivered from the Large Generating Facility to the Point of Interconnection.

Article 8. Communications

8.1 Interconnection Customer Obligations.

Interconnection Customer shall maintain satisfactory operating communications

with Transmission Owner's Transmission System dispatcher or representative designated by Transmission Owner. Interconnection Customer shall provide standard voice line, dedicated voice line and facsimile communications at its Large Generating Facility control room or central dispatch facility through use of either the public telephone system, or a voice communications system that does not rely on the public telephone system. Interconnection Customer shall also provide the dedicated data circuit(s) necessary to provide Interconnection Customer data to Transmission Owner as set forth in Appendix D, Security Arrangements Details. The data circuit(s) shall extend from the Large Generating Facility to the location(s) specified by Transmission Owner. Any required maintenance of such communications equipment shall be performed by Interconnection Customer. Operational communications shall be activated and maintained under, but not be limited to, the following events: system paralleling or separation, scheduled and unscheduled shutdowns, equipment clearances, and hourly and daily load data.

8.2 Remote Terminal Unit.

Prior to the Initial Synchronization Date of the Large Generating Facility, a Remote Terminal Unit, or equivalent data collection and transfer equipment acceptable to the Parties, shall be installed by Interconnection Customer, or by Transmission Owner at Interconnection Customer's expense, to gather accumulated and instantaneous data to be telemetered to the location(s) designated by Transmission Owner through use of a dedicated point-to-point data circuit(s) as indicated in Article 8.1. The communication protocol for the data circuit(s) shall be specified by Transmission Owner. Instantaneous bi-directional analog real power and reactive power flow information must be telemetered directly to the location(s) specified by Transmission Owner. Each Party will promptly advise the other Party if it detects or otherwise learns of any metering, telemetry or communications equipment errors or malfunctions that require the attention and/or correction by the other Party. The Party owning such equipment shall correct such error or malfunction as soon as reasonably feasible.

8.3 No Annexation.

Any and all equipment placed on the premises of a Party shall be and remain the property of the Party providing such equipment regardless of the mode and manner of annexation or attachment to real property, unless otherwise mutually agreed by the Parties.

8.4 Provision of Data from a Variable Energy Resource

The Interconnection Customer whose Generating Facility is a Variable Energy Resource shall provide meteorological and forced outage data to the Transmission Owner to the extent necessary for the Transmission Owner's development and deployment of power production forecasts for that class of Variable Energy Resources. The Interconnection Customer with a Variable Energy Resource having wind as the energy source, at a minimum, will be required to provide the Transmission Owner with site-specific meteorological data including: temperature, wind speed, wind direction, and atmospheric pressure. The Interconnection Customer with a Variable Energy Resource having solar as the energy source, at a minimum, will be required to provide the Transmission Owner

with site-specific meteorological data including: temperature, atmospheric pressure, and irradiance. The Transmission Owner and Interconnection Customer whose Generating Facility is a Variable Energy Resource shall mutually agree to any additional meteorological data that are required for the development and deployment of a power production forecast. The Interconnection Customer whose Generating Facility is a Variable Energy Resource also shall submit data to the Transmission Owner regarding all forced outages to the extent necessary for the Transmission Owner's development and deployment of power production forecasts for that class of Variable Energy Resources. The exact specifications of the meteorological and forced outage data to be provided by the Interconnection Customer to the Transmission Owner, including the frequency and timing of data submittals, shall be made taking into account the size and configuration of the Variable Energy Resource, its characteristics, location, and its importance in maintaining generation resource adequacy and transmission system reliability in its area. All requirements for meteorological and forced outage data must be commensurate with the power production forecasting employed by the Transmission Owner. Such requirements for meteorological and forced outage data are set forth in Appendix C, Interconnection Details, of this LGIA, as they may change from time to time.

Article 9. Operations

9.1 General.

Each Party shall comply with the Applicable Reliability Council requirements. Each Party shall provide to the other Party all information that may reasonably be required by the other Party to comply with Applicable Laws and Regulations and Applicable Reliability Standards.

9.2 Balancing Authority Area Notification.

At least three months before Initial Synchronization Date, Interconnection Customer shall notify ITO and Transmission Owner in writing of the Balancing Authority Area in which the Large Generating Facility will be located. If Interconnection Customer elects to locate the Large Generating Facility in a Balancing Authority Area other than the Balancing Authority Area in which the Large Generating Facility is physically located, and if permitted to do so by the relevant transmission tariffs, all necessary arrangements, including but not limited to those set forth in Article 7 and Article 8 of this LGIA, and remote Balancing Authority Area generator interchange agreements, if applicable, and the appropriate measures under such agreements, shall be executed and implemented prior to the placement of the Large Generating Facility in the other Balancing Authority Area.

9.3 Transmission Owner Obligations.

The Transmission Owner shall cause the Transmission System and Transmission Owner's Interconnection Facilities to be operated, maintained and controlled in a safe and reliable manner and in accordance with this LGIA. Transmission Owner may provide operating instructions to Interconnection Customer consistent with this LGIA and Transmission Owner's operating protocols and procedures as they may change from time to time. Transmission Owner will consider changes

to its operating protocols and procedures proposed by Interconnection Customer.

9.4 Interconnection Customer Obligations.

Interconnection Customer shall at its own expense operate, maintain and control the Large Generating Facility and Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

Interconnection Customer shall operate the Large Generating Facility and Interconnection Customer's Interconnection Facilities in accordance with all applicable requirements of the Balancing Authority Area of which it is part, as such requirements are set forth in Appendix C, Interconnection Details, of this LGIA. Appendix C, Interconnection Details, will be modified to reflect changes to the requirements as they may change from time to time. Either Party may request that the other Party provide copies of the requirements set forth in Appendix C, Interconnection Details, of this LGIA.

9.5 Start-Up and Synchronization.

Consistent with the Parties' mutually acceptable procedures, Interconnection Customer is responsible for the proper synchronization of the Large Generating Facility to Transmission Owner's Transmission System.

9.6 Reactive Power and Primary Frequency Response.

9.6.1 Power Factor Design Criteria.

9.6.1.1 Synchronous Generation.

Interconnection Customer shall design the Large Generating Facility to maintain a composite power delivery at continuous rated power output at the Point of Interconnection at a power factor within the range of 0.95 leading to 0.95 lagging, unless the Transmission Owner has established different requirements that apply to all synchronous generators in the Balancing Authority Area on a comparable basis.

9.6.1.2 Non-Synchronous Generation.

Interconnection Customer shall design the Large Generating Facility 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 0.95 leading to 0.95 lagging, unless the Transmission Owner has established a different power factor range that applies to all non-synchronous generators in the Balancing Authority Area on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors, or a combination of the two. This requirement shall only apply to newly interconnecting non-synchronous generators that have not yet executed a

Facilities Study Agreement as of the effective date of the Final Rule establishing this requirement (Order No. 827).

9.6.2 Voltage Schedules.

Once Interconnection Customer has synchronized the Large Generating Facility with the Transmission System, Transmission Owner shall require Interconnection Customer to operate the Large Generating Facility to produce or absorb reactive power within the design limitations of the Large Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). Transmission Owner's voltage schedules shall treat all sources of reactive power in the Balancing Authority Area in an equitable and not unduly discriminatory manner. Transmission Owner shall exercise Reasonable Efforts to provide Interconnection Customer with such schedules at least one (1) day in advance, and may make changes to such schedules as necessary to maintain the reliability of the Transmission System. Interconnection Customer shall operate the Large Generating Facility to maintain the specified output voltage or power factor at the Point of Interconnection within the design limitations of the Large Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). If Interconnection Customer is unable to maintain the specified voltage or power factor, it shall promptly notify the System Operator.

9.6.2.1 Voltage Regulators.

Whenever the Large Generating Facility is operated in parallel with the Transmission System and voltage regulators are capable of operation, Interconnection Customer shall operate the Large Generating Facility with its and voltage regulators in automatic operation. If the Large Generating Facility's speed governors and voltage regulators are not capable of such automatic operation, Interconnection Customer shall immediately notify Transmission Owner, or its designated representative, and ensure that such Large Generating Facility's reactive power production or absorption (measured in MVARs) are within the design capability of the Large Generating Facility's generating unit(s) and steady state stability limits. Interconnection Customer shall not cause its Large Generating Facility to disconnect automatically or instantaneously from the Transmission System or trip any generating unit comprising the Large Generating Facility for an under or over frequency condition unless the abnormal frequency condition persists for a time period beyond the limits set forth in ANSI/IEEE Standard C37.106, or such other standard as applied to other generators in the Balancing Authority Area on a comparable basis.

9.6.3 Payment for Reactive Power.

Transmission Owner is required to pay Interconnection Customer for reactive power that Interconnection Customer provides or absorbs from the Large Generating Facility when Transmission Owner requests Interconnection Customer to operate its Large Generating Facility outside the range specified in Article 9.6.1, provided that if Transmission Owner pays its own or affiliated generators for reactive power service within the specified range, Transmission Owner must also pay Interconnection Customer. Payments shall be pursuant to Article 11.6 or such other agreement to which the Parties have otherwise agreed.

9.6.4 Primary Frequency Response

Interconnection Customer shall ensure the primary frequency response capability of its Large Generating Facility by installing, maintaining, and operating a functioning governor or equivalent controls. The term “functioning governor or equivalent controls” as used herein shall mean the required hardware and/or software that provides frequency responsive real power control with the ability to sense changes in system frequency and autonomously adjust the Large Generating Facility’s real power output in accordance with the droop and deadband parameters and in the direction needed to correct frequency deviations.

Interconnection Customer is required to install a governor or equivalent controls with the capability of operating: (1) with a maximum 5 percent droop and ± 0.036 Hz deadband; or (2) in accordance with the relevant droop, deadband, and timely and sustained response settings from an approved NERC Reliability Standard providing for equivalent or more stringent parameters. The droop characteristic shall be: (1) based on the nameplate capacity of the Large Generating Facility, and shall be linear in the range of frequencies between 59 to 61 Hz that are outside of the deadband parameter; or (2) based on an approved NERC Reliability Standard providing for an equivalent or more stringent parameter. The deadband parameter shall be: the range of frequencies above and below nominal (60 Hz) in which the governor or equivalent controls is not expected to adjust the Large Generating Facility’s real power output in response to frequency deviations. The deadband shall be implemented: (1) without a step to the droop curve, that is, once the frequency deviation exceeds the deadband parameter, the expected change in the Large Generating Facility’s real power output in response to frequency deviations shall start from zero and then increase (for under-frequency deviations) or decrease (for over-frequency deviations) linearly in proportion to the magnitude of the frequency deviation; or (2) in accordance with an approved NERC Reliability Standard providing for an equivalent or more stringent parameter. Interconnection Customer shall notify Transmission Owner that the primary frequency response capability of the Large Generating Facility has been tested and confirmed during commissioning. Once Interconnection Customer has synchronized the Large Generating Facility with the Transmission System, Interconnection Customer shall operate the Large Generating Facility consistent with the provisions specified in Sections 9.6.4.1 and 9.6.4.2 of this Agreement. The primary frequency response requirements contained herein shall apply to both synchronous and non-synchronous Large Generating Facilities.

9.6.4.1 Governor or Equivalent Controls. Whenever the Large Generating Facility is operated in parallel with the Transmission System, Interconnection Customer shall operate the Large Generating Facility with its governor or equivalent controls in service and responsive to frequency. Interconnection Customer shall: (1) in coordination with Transmission Owner and/or the relevant balancing authority, set the deadband parameter to: (1) a maximum of ± 0.036 Hz and set the droop parameter to a maximum of 5 percent; or (2) implement the relevant droop and deadband settings from an approved NERC Reliability Standard that provides for equivalent or more stringent parameters. Interconnection Customer shall be required to provide the status and settings of the governor or equivalent controls to Transmission Owner and/or the relevant balancing authority upon request. If Interconnection Customer needs to operate the Large Generating Facility with its governor or equivalent controls not in service, Interconnection Customer shall immediately notify Transmission Owner and the relevant balancing authority, and provide both with the following information: (1) the operating status of the governor or equivalent controls (i.e., whether it is currently out of service or when it will be taken out of service); (2) the reasons for removing the governor or equivalent controls from service; and (3) a reasonable estimate of when the governor or equivalent controls will be returned to service. Interconnection Customer shall make Reasonable Efforts to return its governor or equivalent controls into service as soon as practicable. Interconnection Customer shall make Reasonable Efforts to keep outages of the Large Generating Facility's governor or equivalent controls to a minimum whenever the Large Generating Facility is operated in parallel with the Transmission System.

9.6.4.2 Timely and Sustained Response. Interconnection Customer shall ensure that the Large Generating Facility's real power response to sustained frequency deviations outside of the deadband setting is automatically provided and shall begin immediately after frequency deviates outside of the deadband, and to the extent the Large Generating Facility has operating capability in the direction needed to correct the frequency deviation. Interconnection Customer shall not block or otherwise inhibit the ability of the governor or equivalent controls to respond and shall ensure that the response is not inhibited, except under certain operational constraints including, but not limited to, ambient temperature limitations, physical energy limitations, outages of mechanical equipment, or regulatory requirements. The Large Generating Facility shall sustain the real power response at least until system frequency returns to a value within the deadband setting of the governor or equivalent controls. A Commission-approved Reliability Standard with equivalent or more stringent requirements shall supersede the above requirements.

9.6.4.3 Exemptions. Large Generating Facilities that are regulated by the United States Nuclear Regulatory Commission shall be exempt from

Sections 9.6.4, 9.6.4.1, and 9.6.4.2 of this Agreement. Large Generating Facilities that are behind the meter generation that is sized-to-load (i.e., the thermal load and the generation are near-balanced in real-time operation and the generation is primarily controlled to maintain the unique thermal, chemical, or mechanical output necessary for the operating requirements of its host facility) shall be required to install primary frequency response capability in accordance with the droop and deadband capability requirements specified in Section 9.6.4, but shall be otherwise exempt from the operating requirements in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.4 of this Agreement.

9.6.4.4 Electric Storage Resources. Interconnection Customer interconnecting an electric storage resource shall establish an operating range in Appendix C of its LGIA that specifies a minimum state of charge and a maximum state of charge between which the electric storage resource will be required to provide primary frequency response consistent with the conditions set forth in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.3 of this Agreement. Appendix C shall specify whether the operating range is static or dynamic, and shall consider (1) the expected magnitude of frequency deviations in the interconnection; (2) the expected duration that system frequency will remain outside of the deadband parameter in the interconnection; (3) the expected incidence of frequency deviations outside of the deadband parameter in the interconnection; (4) the physical capabilities of the electric storage resource; (5) operational limitations of the electric storage resource due to manufacturer specifications; and (6) any other relevant factors agreed to by Transmission Owner and Interconnection Customer, and in consultation with the relevant transmission owner or balancing authority as appropriate. If the operating range is dynamic, then Appendix C must establish how frequently the operating range will be reevaluated and the factors that may be considered during its reevaluation.

Interconnection Customer's electric storage resource is required to provide timely and sustained primary frequency response consistent with Section 9.6.4.2 of this Agreement when it is online and dispatched to inject electricity to the Transmission System and/or receive electricity from the Transmission System. This excludes circumstances when the electric storage resource is not dispatched to inject electricity to the Transmission System and/or dispatched to receive electricity from the Transmission System. If Interconnection Customer's electric storage resource is charging at the time of a frequency deviation outside of its deadband parameter, it is to increase (for over-frequency deviations) or decrease (for under-frequency deviations) the rate at which it is charging in accordance with its droop parameter. Interconnection Customer's electric storage resource is not required to change from charging to discharging, or vice versa, unless the response necessitated by the droop and deadband settings requires it to do so and it is technically capable of making such a transition.

9.7 Outages and Interruptions.

9.7.1 Outages.

9.7.1.1 Outage Authority and Coordination.

Each Party may in accordance with Good Utility Practice in coordination with the other Party remove from service any of its respective Interconnection Facilities or Network Upgrades that may impact the other Party's facilities as necessary to perform maintenance or testing or to install or replace equipment. Absent an Emergency Condition, the Party scheduling a removal of such facility(ies) from service will use Reasonable Efforts to schedule such removal on a date and time mutually acceptable to the Parties. In all circumstances, any Party planning to remove such facility(ies) from service shall use Reasonable Efforts to minimize the effect on the other Party of such removal.

9.7.1.2 Outage Schedules.

ITO shall post scheduled outages of the transmission facilities on the OASIS. Interconnection Customer shall submit its planned maintenance schedules for the Large Generating Facility to the ITO and Transmission Owner for a minimum of a rolling twenty-four month period. Interconnection Customer shall update its planned maintenance schedules as necessary. Transmission Owner may request Interconnection Customer to reschedule its maintenance as necessary to maintain the reliability of the Transmission System; provided, however, adequacy of generation supply shall not be a criterion in determining Transmission System reliability. Transmission Owner shall compensate Interconnection Customer for any additional direct costs that Interconnection Customer incurs as a result of having to reschedule maintenance, including any additional overtime, breaking of maintenance contracts or other costs above and beyond the cost Interconnection Customer would have incurred absent Transmission Owner's request to reschedule maintenance. Interconnection Customer will not be eligible to receive compensation, if during the twelve (12) months prior to the date of the scheduled maintenance, Interconnection Customer had modified its schedule of maintenance activities.

9.7.1.3 Outage Restoration.

If an outage on a Party's Interconnection Facilities or Network Upgrades adversely affects the other Party's operations or facilities, the Party that owns or controls the facility that is out of service shall use Reasonable Efforts to

promptly restore such facility(ies) to a normal operating condition consistent with the nature of the outage. The Party that owns or controls the facility that is out of service shall provide the other Party, to the extent such information is known, information on the nature of the Emergency Condition, an estimated time of restoration, and any corrective actions required. Initial verbal notice shall be followed up as soon as practicable with written notice explaining the nature of the outage.

9.7.2 Interruption of Service.

If required by Good Utility Practice to do so, Transmission Owner may require Interconnection Customer to interrupt or reduce deliveries of electricity if such delivery of electricity could adversely affect Transmission Owner's ability to perform such activities as are necessary to safely and reliably operate and maintain the Transmission System. The following provisions shall apply to any interruption or reduction permitted under this Article 9.7.2:

- 9.7.2.1** The interruption or reduction shall continue only for so long as reasonably necessary under Good Utility Practice;
- 9.7.2.2** Any such interruption or reduction shall be made on an equitable, non-discriminatory basis with respect to all generating facilities directly connected to the Transmission System;
- 9.7.2.3** When the interruption or reduction must be made under circumstances which do not allow for advance notice, Transmission Owner shall notify Interconnection Customer by telephone as soon as practicable of the reasons for the curtailment, interruption, or reduction, and, if known, its expected duration. Telephone notification shall be followed by written notification as soon as practicable;
- 9.7.2.4** Except during the existence of an Emergency Condition, when the interruption or reduction can be scheduled without advance notice, Transmission Owner or Reliability Coordinator shall notify Interconnection Customer in advance regarding the timing of such scheduling and further notify Interconnection Customer of the expected duration. Transmission Owner shall coordinate with Interconnection Customer using Good Utility Practice to schedule the interruption or reduction during periods of least impact to Interconnection Customer and Transmission Owner;
- 9.7.2.5** The Parties shall cooperate and coordinate with each other to the extent necessary in order to restore the Large Generating Facility, Interconnection Facilities, and the Transmission System to their normal operating state, consistent with system conditions and Good Utility Practice.

9.7.3 Under-Frequency and Over-Frequency Conditions.

The Transmission System is designed to automatically activate a loadshed program as required by the Applicable Reliability Council in the event of an under-frequency system disturbance. Interconnection Customer shall implement under-frequency and over-frequency relay set points for the Large Generating Facility as required by the Applicable Reliability Council to ensure "ride through" capability of the Transmission System. Large Generating Facility response to frequency deviations of pre-determined magnitudes, both under-frequency and over-frequency deviations, shall be studied and coordinated with Transmission Owner in accordance with Good Utility Practice. The term "ride through" as used herein shall mean the ability of a Generating Facility to stay connected to and synchronized with the Transmission System during system disturbances within a range of under-frequency and over-frequency conditions, in accordance with Good Utility Practice.

9.7.4 System Protection and Other Control Requirements.

9.7.4.1 System Protection Facilities.

Interconnection Customer shall, at its expense, install, operate and maintain System Protection Facilities as a part of the Large Generating Facility or Interconnection Customer's Interconnection Facilities. Transmission Owner shall install at Interconnection Customer's expense any System Protection Facilities that may be required on Transmission Owner's Interconnection Facilities or the Transmission System as a result of the interconnection of the Large Generating Facility and Interconnection Customer's Interconnection Facilities.

9.7.4.2 Each Party's protection facilities shall be designed and coordinated with other systems in accordance with Good Utility Practice.

9.7.4.3 Each Party shall be responsible for protection of its facilities consistent with Good Utility Practice.

9.7.4.4 Each Party's protective relay design shall incorporate the necessary test switches to perform the tests required in Article 6. The required test switches will be placed such that they allow operation of lockout relays while preventing breaker failure schemes from operating and causing unnecessary breaker operations and/or the tripping of Interconnection Customer's units.

9.7.4.5 Each Party will test, operate and maintain System Protection Facilities in accordance with Good Utility Practice.

9.7.4.6 Prior to the In-Service Date, and again prior to the Commercial Operation Date, each Party or its agent shall perform a complete calibration test and functional trip test of the System Protection Facilities. At intervals suggested by Good Utility Practice and following any apparent malfunction of the System Protection Facilities, each Party

shall perform both calibration and functional trip tests of its System Protection Facilities. These tests do not require the tripping of any in-service generation unit. These tests do, however, require that all protective relays and lockout contacts be activated.

9.7.5 Requirements for Protection.

In compliance with Good Utility Practice, Interconnection Customer shall provide, install, own, and maintain relays, circuit breakers and all other devices necessary to remove any fault contribution of the Large Generating Facility to any short circuit occurring on the Transmission System not otherwise isolated by Transmission Owner's equipment, such that the removal of the fault contribution shall be coordinated with the protective requirements of the Transmission System. Such protective equipment shall include, without limitation, a disconnecting device or switch with load-interrupting capability located between the Large Generating Facility and the Transmission System at a site selected upon mutual agreement (not to be unreasonably withheld, conditioned or delayed) of the Parties. Interconnection Customer shall be responsible for protection of the Large Generating Facility and Interconnection Customer's other equipment from such conditions as negative sequence currents, over- or under-frequency, sudden load rejection, over- or undervoltage, and generator loss-of-field. Interconnection Customer shall be solely responsible to disconnect the Large Generating Facility and Interconnection Customer's other equipment if conditions on the Transmission System could adversely affect the Large Generating Facility.

9.7.6 Power Quality.

No Party's facilities shall cause excessive voltage flicker nor introduce excessive distortion to the sinusoidal voltage or current waves as defined by ANSI Standard C84.1-1989, in accordance with IEEE Standard 519, or any applicable superseding electric industry standard. In the event of a conflict between ANSI Standard C84.1-1989, or any applicable superseding electric industry standard, ANSI Standard C84.1-1989, or the applicable superseding electric industry standard, shall control.

9.8 Switching and Tagging Rules.

Each Party shall provide the other Party a copy of its switching and tagging rules that are applicable to the other Party's activities. Such switching and tagging rules shall be developed on a non-discriminatory basis. The Parties shall comply with applicable switching and tagging rules, as amended from time to time, in obtaining clearances for work or for switching operations on equipment.

9.9 Use of Interconnection Facilities by Third Parties.

9.9.1 Purpose of Interconnection Facilities.

Except as may be required by Applicable Laws and Regulations, or as otherwise agreed to between the Parties, the Interconnection Facilities shall be constructed for the sole purpose of interconnecting the Large

Generating Facility to the Transmission System and shall be used for no other purpose.

9.9.2 Third Party Users.

If required by Applicable Laws and Regulations or if the Parties mutually agree, such agreement not to be unreasonably withheld, to allow one or more third parties to use Transmission Owner's Interconnection Facilities, or any part thereof, Interconnection Customer will be entitled to compensation for the capital expenses it incurred in connection with the Interconnection Facilities based upon the pro rata use of the Interconnection Facilities by Transmission Owner, all third party users, and Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually-agreed upon methodology. In addition, cost responsibility for ongoing costs, including operation and maintenance costs associated with the Interconnection Facilities, will be allocated between Interconnection Customer and any third party users based upon the pro rata use of the Interconnection Facilities by Transmission Owner, all third party users, and Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually agreed upon methodology. If the issue of such compensation or allocation cannot be resolved through such negotiations, it shall be submitted to FERC for resolution.

9.10 Disturbance Analysis Data Exchange.

The Parties will cooperate with one another in the analysis of disturbances to either the Large Generating Facility or Transmission Owner's Transmission System by gathering and providing access to any information relating to any disturbance, including information from oscillography, protective relay targets, breaker operations and sequence of events records, and any disturbance information required by Good Utility Practice.

Article 10. Maintenance

10.1 Transmission Owner Obligations.

Transmission Owner shall maintain the Transmission System and Transmission Owner's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.2 Interconnection Customer Obligations.

Interconnection Customer shall maintain the Large Generating Facility and Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.3 Coordination.

The Parties shall confer regularly to coordinate the planning, scheduling and performance of preventive and corrective maintenance on the Large Generating Facility and the Interconnection Facilities.

10.4 Secondary Systems.

Each Party shall cooperate with the other Party in the inspection, maintenance,

and testing of control or power circuits that operate below 600 volts, AC or DC, including, but not limited to, any hardware, control or protective devices, cables, conductors, electric raceways, secondary equipment panels, transducers, batteries, chargers, and voltage and current transformers that directly affect the operation of a Party's facilities and equipment which may reasonably be expected to impact the other Party. Each Party shall provide advance notice to the other Party before undertaking any work on such circuits, especially on electrical circuits involving circuit breaker trip and close contacts, current transformers, or potential transformers.

10.5 Operating and Maintenance Expenses.

Subject to the provisions herein addressing the use of facilities by others, and except for operations and maintenance expenses associated with modifications made for providing interconnection or transmission service to a third party and such third party pays for such expenses, Interconnection Customer shall be responsible for all reasonable expenses including overheads, associated with: (1) owning, operating, maintaining, repairing, and replacing Interconnection Customer's Interconnection Facilities; and (2) operation, maintenance, repair and replacement of Transmission Owner's Interconnection Facilities.

Article 11. Performance Obligation

11.1 Interconnection Customer Interconnection Facilities.

Interconnection Customer shall design, procure, construct, install, own and/or control Interconnection Customer Interconnection Facilities described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades, at its sole expense.

11.2 Transmission Owner's Interconnection Facilities.

Transmission Owner shall design, procure, construct, install, own and/or control the Transmission Owner's Interconnection Facilities described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades, at the sole expense of the Interconnection Customer.

11.3 Network Upgrades and Distribution Upgrades.

Transmission Owner shall design, procure, construct, install, and own the Network Upgrades and Distribution Upgrades described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades. The Interconnection Customer shall be responsible for all costs related to Distribution Upgrades. Unless Transmission Owner elects to fund the capital for the Network Upgrades, they shall be solely funded by Interconnection Customer.

11.4 Transmission Credits.

11.4.1 Repayment of Amounts Advanced for Network Upgrades.

Interconnection Customer shall be entitled to a cash repayment, equal to the total amount paid to Transmission Owner and Affected System Operator, if any, for the Network Upgrades, including any tax gross-up or other tax-related payments associated with Network Upgrades, and not refunded to Interconnection Customer pursuant to Article 5.17.8 or otherwise, to be paid to Interconnection Customer on a dollar-for-

dollar basis for the nonusage sensitive portion of transmission charges, as payments are made under Transmission Owner's Tariff and Affected System's Tariff for transmission services with respect to the Large Generating Facility. Any repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 CFR § 35.19a(a)(2)(iii) from the date of any payment for Network Upgrades through the date on which the Interconnection Customer receives a repayment of such payment pursuant to this subparagraph. Interconnection Customer may assign such repayment rights to any person.

Notwithstanding the foregoing, Interconnection Customer, Transmission Owner, and Affected System Operator may adopt any alternative payment schedule that is mutually agreeable so long as Transmission Owner and Affected System Operator take one of the following actions no later than five years from the Commercial Operation Date: (1) return to Interconnection Customer any amounts advanced for Network Upgrades not previously repaid, or (2) declare in writing that Transmission Owner or Affected System Operator will continue to provide payments to Interconnection Customer on a dollar-for-dollar basis for the non-usage sensitive portion of transmission charges, or develop an alternative schedule that is mutually agreeable and provides for the return of all amounts advanced for Network Upgrades not previously repaid; however, full reimbursement shall not extend beyond twenty (20) years from the Commercial Operation Date.

If the Large Generating Facility fails to achieve commercial operation, but it or another Generating Facility is later constructed and makes use of the Network Upgrades, Transmission Owner and Affected System Operator shall at that time reimburse Interconnection Customer for the amounts advanced for the Network Upgrades. Before any such reimbursement can occur, the Interconnection Customer, or the entity that ultimately constructs the Generating Facility, if different, is responsible for identifying the entity to which reimbursement must be made.

11.4.2 Special Provisions for Affected Systems.

Unless Transmission Owner provides, under the LGIA, for the repayment of amounts advanced to Affected System Operator for Network Upgrades, Interconnection Customer and Affected System Operator shall enter into an agreement that provides for such repayment. The agreement shall specify the terms governing payments to be made by Interconnection Customer to the Affected System Operator as well as the repayment by the Affected System Operator.

11.4.3 Notwithstanding any other provision of this LGIA, nothing herein shall be construed as relinquishing or foreclosing any rights, including but not limited to firm transmission rights, capacity rights, transmission congestion rights, or transmission credits, that Interconnection Customer, shall be entitled to, now or in the future

under any other agreement or tariff as a result of, or otherwise associated with, the transfer capability, if any, created by the Network Upgrades, including the right to obtain cash reimbursements or transmission credits for transmission service that is not associated with the Large Generating Facility.

11.5 Provision of Security.

At least thirty (30) Calendar Days prior to the commencement of the procurement, installation, or construction of a discrete portion of a Transmission Owner's Interconnection Facilities, Network Upgrades, or Distribution Upgrades, Interconnection Customer shall provide Transmission Owner, at Interconnection Customer's option, a guarantee, a surety bond, letter of credit or other form of security that is reasonably acceptable to Transmission Owner and is consistent with the Uniform Commercial Code of the jurisdiction identified in Article 14.2.1. Such security for payment shall be in an amount sufficient to cover the costs for constructing, procuring and installing the applicable portion of Transmission Owner's Interconnection Facilities, Network Upgrades, or Distribution Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to Transmission Owner for these purposes.

In addition:

- 11.5.1** The guarantee must be made by an entity that meets the creditworthiness requirements of Transmission Owner, and contain terms and conditions that guarantee payment of any amount that may be due from Interconnection Customer, up to an agreed-to maximum amount.
- 11.5.2** The letter of credit must be issued by a financial institution reasonably acceptable to Transmission Owner and must specify a reasonable expiration date.
- 11.5.3** The surety bond must be issued by an insurer reasonably acceptable to Transmission Owner and must specify a reasonable expiration date.

11.6 Interconnection Customer Compensation.

If Transmission Owner requests or directs Interconnection Customer to provide a service pursuant to Articles 9.6.3 (Payment for Reactive Power), or 13.5.1 of this LGIA, Transmission Owner shall compensate Interconnection Customer in accordance with Interconnection Customer's applicable rate schedule then in effect unless the provision of such service(s) is subject to an RTO or ISO FERC-approved rate schedule. Interconnection Customer shall serve Transmission Owner or RTO or ISO with any filing of a proposed rate schedule at the time of such filing with FERC. To the extent that no rate schedule is in effect at the time the Interconnection Customer is required to provide or absorb any Reactive Power under this LGIA, Transmission Owner agrees to compensate Interconnection Customer in such amount as would have been due Interconnection Customer had the rate schedule been in effect at the time service commenced; provided, however, that such rate schedule must be filed at FERC or other appropriate Governmental Authority within sixty (60) Calendar Days of the commencement of service.

- 11.6.1 Interconnection Customer Compensation for Actions During Emergency Condition.**

Transmission Owner shall compensate Interconnection Customer for its provision of real and reactive power and other Emergency Condition services that Interconnection Customer provides to support the Transmission System during an Emergency Condition in accordance with Article 11.6.

Article 12. Invoice

12.1 General.

Each Party shall submit to the other Party, on a monthly basis, invoices of amounts due for the preceding month. Each invoice shall state the month to which the invoice applies and fully describe the services and equipment provided. The Parties may discharge mutual debts and payment obligations due and owing to each other on the same date through netting, in which case all amounts a Party owes to the other Party under this LGIA, including interest payments or credits, shall be netted so that only the net amount remaining due shall be paid by the owing Party.

12.2 Final Invoice.

Within six months after completion of the construction of Transmission Owner's Interconnection Facilities and the Network Upgrades, Transmission Owner shall provide an invoice of the final cost of the construction of Transmission Owner's Interconnection Facilities and the Network Upgrades and shall set forth such costs in sufficient detail to enable Interconnection Customer to compare the actual costs with the estimates and to ascertain deviations, if any, from the cost estimates. Transmission Owner shall refund to Interconnection Customer any amount by which the actual payment by Interconnection Customer for estimated costs exceeds the actual costs of construction within thirty (30) Calendar Days of the issuance of such final construction invoice.

12.3 Payment.

Invoices shall be rendered to the paying Party at the address specified in Appendix F. The Party receiving the invoice shall pay the invoice within thirty (30) Calendar Days of receipt. All payments shall be made in immediately available funds payable to the other Party, or by wire transfer to a bank named and account designated by the invoicing Party. Payment of invoices by any Party will not constitute a waiver of any rights or claims either Party may have under this LGIA.

12.4 Disputes.

In the event of a billing dispute between Transmission Owner and Interconnection Customer, Transmission Owner shall continue to provide Interconnection Service under this LGIA as long as Interconnection Customer: (i) continues to make all payments not in dispute; and (ii) pays to Transmission Owner or into an independent escrow account the portion of the invoice in dispute, pending resolution of such dispute. If Interconnection Customer fails to meet these two requirements for continuation of service, then Transmission Owner may provide notice to Interconnection Customer of a Default pursuant to Article 17. Within thirty (30) Calendar Days after the resolution of the dispute, the Party that owes

money to the other Party shall pay the amount due with interest calculated in accord with the methodology set forth in FERC's regulations at 18 CFR § a(a)(2)(iii).

Article 13. Emergencies

13.1 Definition.

"Emergency Condition" shall mean a condition or situation: (i) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (ii) that, in the case of Transmission Owner, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to the Transmission System, Transmission Owner's Interconnection Facilities or the Transmission Systems of others to which the Transmission System is directly connected; or (iii) that, in the case of Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Large Generating Facility or Interconnection Customer's Interconnection Facilities' System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by this LGIA to possess black start capability.

13.2 Obligations.

Each Party shall comply with the Emergency Condition procedures of the applicable Reliability Coordinator, NERC, the Applicable Reliability Council, Applicable Laws and Regulations, and any emergency procedures agreed to by the Joint Operating Committee.

13.3 Notice.

Transmission Owner shall notify Interconnection Customer promptly when it becomes aware of an Emergency Condition that affects Transmission Owner's Interconnection Facilities or the Transmission System that may reasonably be expected to affect Interconnection Customer's operation of the Large Generating Facility or Interconnection Customer's Interconnection Facilities.

Interconnection Customer shall notify Transmission Owner promptly when it becomes aware of an Emergency Condition that affects the Large Generating Facility or Interconnection Customer's Interconnection Facilities that may reasonably be expected to affect the Transmission System or Transmission Owner's Interconnection Facilities. To the extent information is known, the notification shall describe the Emergency Condition, the extent of the damage or deficiency, the expected effect on the operation of Interconnection Customer's or Transmission Owner's facilities and operations, its anticipated duration and the corrective action taken and/or to be taken. The initial notice shall be followed as soon as practicable with written notice.

13.4 Immediate Action.

Unless, in Interconnection Customer's reasonable judgment, immediate action is required, Interconnection Customer shall obtain the consent of Transmission Owner, such consent to not be unreasonably withheld, prior to performing any manual switching operations at the Large Generating Facility or Interconnection

Customer's Interconnection Facilities in response to an Emergency Condition either declared by Transmission Owner or otherwise regarding the Transmission System.

13.5 Reliability Coordinator's Authority.

13.5.1 General.

Reliability Coordinator may take whatever actions or inactions with regard to the Transmission System or Transmission Owner's Interconnection Facilities it deems necessary during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the Transmission System or Transmission Owner's Interconnection Facilities, (iii) limit or prevent damage, and (iv) expedite restoration of service.

Reliability Coordinator shall use Reasonable Efforts to minimize the effect of such actions or inactions on the Large Generating Facility or Interconnection Customer's Interconnection Facilities. Reliability Coordinator may, on the basis of technical considerations, require the Large Generating Facility to mitigate an Emergency Condition by taking actions necessary and limited in scope to remedy the Emergency Condition, including, but not limited to, directing Interconnection Customer to shut-down, start-up, increase or decrease the real or reactive power output of the Large Generating Facility; implementing a reduction or disconnection pursuant to Article 13.5.2; directing Interconnection Customer to assist with blackstart (if available) or restoration efforts; or altering the outage schedules of the Large Generating Facility and Interconnection Customer's Interconnection Facilities. Interconnection Customer shall comply with all of Reliability Coordinator's operating instructions concerning Large Generating Facility real power and reactive power output within the manufacturer's design limitations of the Large Generating Facility's equipment that is in service and physically available for operation at the time, in compliance with Applicable Laws and Regulations.

13.5.2 Reduction and Disconnection.

Reliability Coordinator may reduce Interconnection Service or disconnect the Large Generating Facility or Interconnection Customer's Interconnection Facilities, when such reduction or disconnection is necessary under Good Utility Practice due to Emergency Conditions. These rights are separate and distinct from any right of curtailment of Transmission Owner pursuant to Transmission Owner's Tariff. When Transmission Owner can schedule the reduction or disconnection in advance, Transmission Owner shall notify Interconnection Customer of the reasons, timing and expected duration of the reduction or disconnection. Transmission Owner shall coordinate with Interconnection Customer using Good Utility Practice to schedule the reduction or disconnection during periods of least impact to Interconnection Customer and Transmission Owner. Any reduction or disconnection shall continue

only for so long as reasonably necessary under Good Utility Practice. The Parties shall cooperate with each other to restore the Large Generating Facility, the Interconnection Facilities, and the Transmission System to their normal operating state as soon as practicable consistent with Good Utility Practice.

13.6 Interconnection Customer Authority.

Consistent with Good Utility Practice and the LGIA and the LGIP, Interconnection Customer may take actions or inactions with regard to the Large Generating Facility or Interconnection Customer's Interconnection Facilities during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the Large Generating Facility or Interconnection Customer's Interconnection Facilities, (iii) limit or prevent damage, and (iv) expedite restoration of service. Interconnection Customer shall use Reasonable Efforts to minimize the effect of such actions or inactions on the Transmission System and Transmission Owner's Interconnection Facilities. Transmission Owner shall use Reasonable Efforts to assist Interconnection Customer in such actions.

13.7 Limited Liability.

Except as otherwise provided in Article 11.6.1 of this LGIA, neither Party shall be liable to the other for any action it takes in responding to an Emergency Condition so long as such action is made in good faith and is consistent with Good Utility Practice.

Article 14. Regulatory Requirements and Governing Law

14.1 Regulatory Requirements.

Each Party's obligations under this LGIA shall be subject to its receipt of any required approval or certificate from one or more Governmental Authorities in the form and substance satisfactory to the applying Party, or the Party making any required filings with, or providing notice to, such Governmental Authorities, and the expiration of any time period associated therewith. Each Party shall in good faith seek and use its Reasonable Efforts to obtain such other approvals. Nothing in this LGIA shall require Interconnection Customer to take any action that could result in its inability to obtain, or its loss of, status or exemption under the Federal Power Act, the Public Utility Holding Company Act of 1935, as amended, or the Public Utility Regulatory Policies Act of 1978.

14.2 Governing Law.

14.2.1 The validity, interpretation and performance of this LGIA and each of its provisions shall be governed by the laws of the state where the Point of Interconnection is located, without regard to its conflicts of law principles.

14.2.2 This LGIA is subject to all Applicable Laws and Regulations.

14.2.3 Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, rules, or regulations of a Governmental Authority.

Article 15. Notices

15.1 General.

Unless otherwise provided in this LGIA, any notice, demand or request required or permitted to be given by a Party to the other Party and any instrument required or permitted to be tendered or delivered by either Party in writing to the other shall be effective when delivered and may be so given, tendered or delivered, by recognized national courier, or by depositing the same with the United States Postal Service with postage prepaid, for delivery by certified or registered mail, addressed to the Party, or personally delivered to the Party, at the address set out in Appendix F, Addresses for Delivery of Notices and Billings.

Each Party may change the notice information in this LGIA by giving five (5) Business Days written notice prior to the effective date of the change.

15.2 Billings and Payments.

Billings and payments shall be sent to the addresses set out in Appendix F.

15.3 Alternative Forms of Notice.

Any notice or request required or permitted to be given by a Party to another and not required by this Agreement to be given in writing may be so given by telephone, facsimile or email to the telephone numbers and email addresses set out in Appendix F.

15.4 Operations and Maintenance Notice.

Each Party shall notify the other Party in writing of the identity of the person(s) that it designates as the point(s) of contact with respect to the implementation of Articles 9 and 10.

Article 16. Force Majeure

16.1 Force Majeure.

16.1.1 Economic hardship is not considered a Force Majeure event.

16.1.2 Neither Party shall be considered to be in Default with respect to any obligation hereunder, (including obligations under Article 4), other than the obligation to pay money when due, if prevented from fulfilling such obligation by Force Majeure. A Party unable to fulfill any obligation hereunder (other than an obligation to pay money when due) by reason of Force Majeure shall give notice and the full particulars of such Force Majeure to the other Party in writing or by telephone as soon as reasonably possible after the occurrence of the cause relied upon. Telephone notices given pursuant to this article shall be confirmed in writing as soon as reasonably possible and shall specifically state full particulars of the Force Majeure, the time and date when the Force Majeure occurred and when the Force Majeure is reasonably expected to cease. The Party affected shall exercise due diligence to remove such disability with reasonable dispatch, but shall not be required to accede or agree to any provision not satisfactory to it in order to settle and terminate a strike or other labor disturbance.

Article 17. Default

17.1 Default.

17.1.1 General.

No Default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of Force Majeure as defined in this LGIA or the result of an act of omission of the other Party. Upon a Breach, the non-breaching Party shall give written notice of such Breach to the breaching Party. Except as provided in Article 17.1.2, the breaching Party shall have thirty (30) Calendar Days from receipt of the Default notice within which to cure such Breach; provided however, if such Breach is not capable of cure within thirty (30) Calendar Days, the breaching Party shall commence such cure within thirty (30) Calendar Days after notice and continuously and diligently complete such cure within ninety (90) Calendar Days from receipt of the Default notice; and, if cured within such time, the Breach specified in such notice shall cease to exist.

17.1.2 Right to Terminate.

If a Breach is not cured as provided in this article, or if a Breach is not capable of being cured within the period provided for herein, the nonbreaching Party shall have the right to declare a Default and terminate this LGIA by written notice at any time until cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates this LGIA, to recover from the breaching Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this article will survive termination of this LGIA.

Article 18. Indemnity, Consequential Damages and Insurance

18.1 Indemnity.

The Parties shall at all times indemnify, defend, and hold each other harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or inactions of its obligations under this LGIA on behalf of the Indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.

18.1.1 Indemnified Person.

If an Indemnified Person is entitled to indemnification under this Article 18 as a result of a claim by a third party, and the Indemnifying Party fails, after notice and reasonable opportunity to proceed under Article 18.1, to assume the defense of such claim, such Indemnified Person may at the expense of the Indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

18.1.2 Indemnifying Party.

If an Indemnifying Party is obligated to indemnify and hold any Indemnified Person harmless under this Article 18, the amount owing to the Indemnified Person shall be the amount of such Indemnified Person's actual Loss, net of any insurance or other recovery.

18.1.3 Indemnity Procedures.

Promptly after receipt by an Indemnified Person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in Article 18.1 may apply, the Indemnified Person shall notify the Indemnifying Party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the Indemnifying Party.

The Indemnifying Party shall have the right to assume the defense thereof with counsel designated by such Indemnifying Party and reasonably satisfactory to the Indemnified Person. If the defendants in any such action include one or more Indemnified Persons and the Indemnifying Party and if the Indemnified Person reasonably concludes that there may be legal defenses available to it and/or other Indemnified Persons which are different from or additional to those available to the Indemnifying Party, the Indemnified Person shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the Indemnifying Party shall only be required to pay the fees and expenses of one additional attorney to represent an Indemnified Person or Indemnified Persons having such differing or additional legal defenses.

The Indemnified Person shall be entitled, at its expense, to participate in any such action, suit or proceeding, the defense of which has been assumed by the Indemnifying Party. Notwithstanding the foregoing, the Indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the Indemnified Person and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the Indemnified Person, or there exists a conflict or adversity of interest between the Indemnified Person and the Indemnifying Party, in such event the Indemnifying Party shall pay the reasonable expenses of the Indemnified Person, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the Indemnified Person, which shall not be reasonably withheld, conditioned or delayed.

18.2 Consequential Damages.

Other than the Liquidated Damages heretofore described, in no event shall any Party be liable under any provision of this LGIA for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole

or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to another Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

18.3 Insurance.

Each party shall, at its own expense, maintain in force throughout the period of this LGIA, and until released by the other Party, the following minimum insurance coverages, with insurers authorized to do business in the state where the Point of Interconnection is located:

- 18.3.1** Employers' Liability and Workers' Compensation Insurance providing statutory benefits in accordance with the laws and regulations of the state in which the Point of Interconnection is located.
- 18.3.2** Commercial General Liability Insurance including premises and operations, personal injury, broad form property damage, broad form blanket contractual liability coverage (including coverage for the contractual indemnification) products and completed operations coverage, coverage for explosion, collapse and underground hazards, independent contractors coverage, coverage for pollution to the extent normally available and punitive damages to the extent normally available and a cross liability endorsement, with minimum limits of One Million Dollars (\$1,000,000) per occurrence/One Million Dollars (\$1,000,000) aggregate combined single limit for personal injury, bodily injury, including death and property damage.
- 18.3.3** Comprehensive Automobile Liability Insurance for coverage of owned and non-owned and hired vehicles, trailers or semi-trailers designed for travel on public roads, with a minimum, combined single limit of One Million Dollars (\$1,000,000) per occurrence for bodily injury, including death, and property damage.
- 18.3.4** Excess Public Liability Insurance over and above the Employers' Liability Commercial General Liability and Comprehensive Automobile Liability Insurance coverage, with a minimum combined single limit of Twenty Million Dollars (\$20,000,000) per occurrence/Twenty Million Dollars (\$20,000,000) aggregate.
- 18.3.5** The Commercial General Liability Insurance, Comprehensive Automobile Insurance and Excess Public Liability Insurance policies shall name the other Party, its parent, associated and Affiliate companies and their respective directors, officers, agents, servants and employees ("Other Party Group") as additional insured. All policies shall contain provisions whereby the insurers waive all rights of subrogation in accordance with the provisions of this LGIA against the Other Party Group and provide thirty (30) Calendar Days advance written notice to the Other Party Group prior to anniversary date of cancellation or any material change in coverage or condition.
- 18.3.6** The Commercial General Liability Insurance, Comprehensive Automobile Liability Insurance and Excess Public Liability Insurance policies shall contain provisions that specify that the policies are primary and shall apply to such extent without consideration for other

policies separately carried and shall state that each insured is provided coverage as though a separate policy had been issued to each, except the insurer's liability shall not be increased beyond the amount for which the insurer would have been liable had only one insured been covered. Each Party shall be responsible for its respective deductibles or retentions.

- 18.3.7** The Commercial General Liability Insurance, Comprehensive Automobile Liability Insurance and Excess Public Liability Insurance policies, if written on a Claims First Made Basis, shall be maintained in full force and effect for two (2) years after termination of this LGIA, which coverage may be in the form of tail coverage or extended reporting period coverage if agreed by the Parties.
- 18.3.8** The requirements contained herein as to the types and limits of all insurance to be maintained by the Parties are not intended to and shall not in any manner, limit or qualify the liabilities and obligations assumed by the Parties under this LGIA.
- 18.3.9** Within ten (10) days following execution of this LGIA, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) days thereafter, each Party shall provide certification of all insurance required in this LGIA, executed by each insurer or by an authorized representative of each insurer.
- 18.3.10** Notwithstanding the foregoing, each Party may self-insure to meet the minimum insurance requirements of Articles 18.3.2 through 18.3.8 to the extent it maintains a self-insurance program; provided that, such Party's senior secured debt is rated at investment grade or better by Standard & Poor's and that its self-insurance program meets the minimum insurance requirements of Articles 18.3.2 through 18.3.8. For any period of time that a Party's senior secured debt is unrated by Standard & Poor's or is rated at less than investment grade by Standard & Poor's, such Party shall comply with the insurance requirements applicable to it under Articles 18.3.2 through 18.3.9. In the event that a Party is permitted to self-insure pursuant to this article, it shall notify the other Party that it meets the requirements to self-insure and that its self-insurance program meets the minimum insurance requirements in a manner consistent with that specified in Article 18.3.9.
- 18.3.11** The Parties agree to report to each other in writing as soon as practical all accidents or occurrences resulting in injuries to any person, including death, and any property damage arising out of this LGIA.

Article 19. Assignment

19.1 Assignment.

This LGIA may be assigned by a Party only with the written consent of the other Party; provided that each Party may assign this LGIA without the consent of another Party to any Affiliate of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations

of the assigning Party under this LGIA; and provided further that Interconnection Customer shall have the right to assign this LGIA, without the consent of Transmission Owner, for collateral security purposes to aid in providing financing for the Large Generating Facility, provided that Interconnection Customer will promptly notify Transmission Owner of any such assignment. Any financing arrangement entered into by Interconnection Customer pursuant to this article will provide that prior to or upon the exercise of the secured party's, trustee's or mortgagee's assignment rights pursuant to said arrangement, the secured creditor, the trustee or mortgagee will notify Transmission Owner of the date and particulars of any such exercise of assignment right(s), including providing the Transmission Owner with proof that it meets the requirements of Articles 11.5 and 18.3. Any attempted assignment that violates this article is void and ineffective. Any assignment under this LGIA shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof. Where required, consent to assignment will not be unreasonably withheld, conditioned or delayed.

Article 20. Severability

20.1 Severability.

If any provision in this LGIA is finally determined to be invalid, void or unenforceable by any court or other Governmental Authority having jurisdiction, such determination shall not invalidate, void or make unenforceable any other provision, agreement or covenant of this LGIA; provided that if Interconnection Customer (or any third party, but only if such third party is not acting at the direction of Transmission Owner) seeks and obtains such a final determination with respect to any provision of the Alternate Option (Article 5.1.2), or the Negotiated Option (Article 5.1.4), then none of these provisions shall thereafter have any force or effect and the Parties' rights and obligations shall be governed solely by the Standard Option (Article 5.1.1).

Article 21. Comparability

21.1 Comparability.

The Parties will comply with all applicable comparability and code of conduct laws, rules and regulations, as amended from time to time.

Article 22. Confidentiality

22.1 Confidentiality.

Confidential Information shall include, without limitation, all information relating to a Party's technology, research and development, business affairs, and pricing, and any information supplied by either of the Parties to the other prior to the execution of this LGIA.

Information is Confidential Information only if it is clearly designated or marked in writing as confidential on the face of the document, or, if the information is conveyed orally or by inspection, if the Party providing the information orally informs the Party receiving the information that the information is confidential.

If requested by a Party, the other Party shall provide in writing, the basis for asserting that the information referred to in this Article 22 warrants confidential treatment, and the requesting Party may disclose such writing to the appropriate Governmental Authority. Each Party shall be responsible for the costs associated with affording confidential treatment to its information.

22.1.1 Term.

During the term of this LGIA, and for a period of three (3) years after the expiration or termination of this LGIA, except as otherwise provided in this Article 22, each Party shall hold in confidence and shall not disclose to any person Confidential Information.

22.1.2 Scope.

Confidential Information shall not include information that the receiving Party can demonstrate: (1) is generally available to the public other than as a result of a disclosure by the receiving Party; (2) was in the lawful possession of the receiving Party on a non-confidential basis before receiving it from the disclosing Party; (3) was supplied to the receiving Party without restriction by a third party, who, to the knowledge of the receiving Party after due inquiry, was under no obligation to the disclosing Party to keep such information confidential; (4) was independently developed by the receiving Party without reference to Confidential Information of the disclosing Party; (5) is, or becomes, publicly known, through no wrongful act or omission of the receiving Party or Breach of this LGIA; or (6) is required, in accordance with Article 22.1.7 of the LGIA, Order of Disclosure, to be disclosed by any Governmental Authority or is otherwise required to be disclosed by law or subpoena, or is necessary in any legal proceeding establishing rights and obligations under this LGIA. Information designated as Confidential Information will no longer be deemed confidential if the Party that designated the information as confidential notifies the other Party that it no longer is confidential.

22.1.3 Release of Confidential Information.

A Party shall not release or disclose Confidential Information to any other person, except to its Affiliates (limited by the Standards of Conduct requirements), subcontractors, employees, consultants, or to parties who may be or considering providing financing to or equity participation with Interconnection Customer, or to potential purchasers or assignees of Interconnection Customer, on a need-to-know basis in connection with this LGIA, unless such person has first been advised of the confidentiality provisions of this Article 22 and has agreed to comply with such provisions. Notwithstanding the foregoing, a Party providing Confidential Information to any person shall remain primarily responsible for any release of Confidential Information in contravention of this Article 22.

22.1.4 Rights.

Each Party retains all rights, title, and interest in the Confidential Information that each Party discloses to the other Party. The disclosure by each Party to the other of Confidential Information shall

not be deemed a waiver by a Party or any other person or entity of the right to protect the Confidential Information from public disclosure.

22.1.5 No Warranties.

By providing Confidential Information, neither Party makes any warranties or representations as to its accuracy or completeness. In addition, by supplying Confidential Information, a Party does not obligate itself to provide any particular information or Confidential Information to the other Party nor to enter into any further agreements or proceed with any other relationship or joint venture.

22.1.6 Standard of Care.

Each Party shall use at least the same standard of care to protect Confidential Information it receives as it uses to protect its own Confidential Information from unauthorized disclosure, publication or dissemination. Each Party may use Confidential Information solely to fulfill its obligations to the other Party under this LGIA or its regulatory requirements.

22.1.7 Order of Disclosure.

If a court or a Government Authority or entity with the right, power, and apparent authority to do so requests or requires any Party, by subpoena, oral deposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirement(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this LGIA. Notwithstanding the absence of a protective order or waiver, the Party may disclose such Confidential Information which, in the opinion of its counsel, the Party is legally compelled to disclose. Each Party will use Reasonable Efforts to obtain reliable assurance that confidential treatment will be accorded any Confidential Information so furnished.

22.1.8 Termination of Agreement.

Upon termination of this LGIA for any reason, each Party shall, within ten (10) Calendar Days of receipt of a written request from the other Party, use Reasonable Efforts to destroy, erase, or delete (with such destruction, erasure, and deletion certified in writing to another Party) or return to the other Party, without retaining copies thereof, any and all written or electronic Confidential Information received from the other Party.

22.1.9 Remedies.

The Parties agree that monetary damages would be inadequate to compensate a Party for another Party's Breach of its obligations under this Article 22. Each Party accordingly agrees that the other Party shall be entitled to equitable relief, by way of injunction or otherwise, if the first Party Breaches or threatens to Breach its obligations under this Article 22, which equitable relief shall be granted without bond or proof of damages, and the receiving Party shall not plead in defense that there would be an adequate remedy at law. Such remedy shall not be deemed an exclusive remedy for the Breach of this Article 22,

but shall be in addition to all other remedies available at law or in equity. The Parties further acknowledge and agree that the covenants contained herein are necessary for the protection of legitimate business interests and are reasonable in scope. No Party, however, shall be liable for indirect, incidental, or consequential or punitive damages of any nature or kind resulting from or arising in connection with this Article 22.

22.1.10 Disclosure to FERC, its Staff, or a State.

Notwithstanding anything in this Article 22 to the contrary, and pursuant to 18 CFR section 1b.20, if FERC or its staff, during the course of an investigation or otherwise, requests information from one of the Parties that is otherwise required to be maintained in confidence pursuant to this LGIA, the Party shall provide the requested information to FERC or its staff, within the time provided for in the request for information. In providing the information to FERC or its staff, the Party must, consistent with 18 CFR section 388.112, request that the information be treated as confidential and non-public by FERC and its staff and that the information be withheld from public disclosure. Parties are prohibited from notifying the other Party to this LGIA prior to the release of the Confidential Information to FERC or its staff. The Party shall notify the other Party to the LGIA when it is notified by FERC or its staff that a request to release Confidential Information has been received by FERC, at which time either of the Parties may respond before such information would be made public, pursuant to 18 CFR § 388.112. Requests from a state regulatory body conducting a confidential investigation shall be treated in a similar manner if consistent with the applicable state rules and regulations.

22.1.11 Subject to the exception in Article 22.1.10, any information that a Party claims is competitively sensitive, commercial or financial information under this LGIA ("Confidential Information") shall not be disclosed by either Party to any person not employed or retained by the other Party, except to the extent disclosure is (i) required by law; (ii) reasonably deemed by the disclosing Party to be required to be disclosed in connection with a dispute between the Parties, or the defense of litigation or dispute; (iii) otherwise permitted by consent of the other Party, such consent not to be unreasonably withheld; or (iv) necessary to fulfill its obligations under this LGIA or as a transmission service provider or a Balancing Authority including disclosing the Confidential Information to an RTO or ISO or to a regional or national reliability organization. The Party asserting confidentiality shall notify the other Party in writing of the information it claims is confidential. Prior to any disclosures of the other Party's Confidential Information under this subparagraph, or if any third party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the disclosing Party agrees to promptly notify the other Party in writing and agrees to assert confidentiality and cooperate with the other Party in seeking to protect

the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.

Article 23. Environmental Releases

- 23.1** Each Party shall notify the other Party, first orally and then in writing, of the release of any Hazardous Substances, any asbestos or lead abatement activities, or any type of remediation activities related to the Large Generating Facility or the Interconnection Facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall: (i) provide the notice as soon as practicable, provided such Party makes a good faith effort to provide the notice no later than twenty-four hours after such Party becomes aware of the occurrence; and (ii) promptly furnish to the other Party copies of any publicly available reports filed with any Governmental Authorities addressing such events.

Article 24. Information Requirements

24.1 Information Acquisition.

Transmission Owner and Interconnection Customer shall submit to each other with copies to the ITO specific information regarding the electrical characteristics of their respective facilities as described below and in accordance with Applicable Reliability Standards.

24.2 Information Submission by Transmission Owner.

The initial information submission by Transmission Owner shall occur no later than one hundred eighty (180) Calendar Days prior to Trial Operation and shall include Transmission System information necessary to allow Interconnection Customer to select equipment and meet any system protection and stability requirements, unless otherwise agreed to by the Parties. On a monthly basis the Transmission Owner shall provide Interconnection Customer and ITO a status report on the construction and installation of Transmission Owner's Interconnection Facilities and Network Upgrades, including, but not limited to, the following information: (1) progress to date; (2) a description of the activities since the last report (3) a description of the action items for the next period; and (4) the delivery status of equipment ordered.

24.3 Updated Information Submission by Interconnection Customer.

The updated information submission by Interconnection Customer, including manufacturer information, shall occur no later than one hundred eighty (180) Calendar Days prior to the Trial Operation. Interconnection Customer shall submit a completed copy of the Large Generating Facility data requirements contained in Appendix 1 to the LGIP. It shall also include any additional information provided to ITO for the Feasibility Study and to the Transmission Owner for the Facilities Study. Information in this submission shall be the most current Large Generating Facility design or expected performance data. Information submitted for stability models shall be compatible with Transmission Owner's standard models. If there is no compatible model, Interconnection Customer will work with a consultant mutually agreed to by the Parties to develop and supply a standard model and associated information. If Interconnection Customer's data is materially different from what was originally provided to the

ITO or Transmission Owner pursuant to the Interconnection Study Agreement among the ITO, Transmission Owner, and Interconnection Customer, then the ITO and/or Transmission Owner, as appropriate, will conduct appropriate studies to determine the impact on Transmission Owner's Transmission System based on the actual data submitted pursuant to this Article 24.3. The Interconnection Customer shall not begin Trial Operation until such studies are completed.

24.4 Information Supplementation.

Prior to the Operation Date, the Parties shall supplement their information submissions described above in this Article 24 with any and all "as-built" Large Generating Facility information or "as-tested" performance information that differs from the initial submissions or, alternatively, written confirmation that no such differences exist. The Interconnection Customer shall conduct tests on the Large Generating Facility as required by Good Utility Practice such as an open circuit "step voltage" test on the Large Generating Facility to verify proper operation of the Large Generating Facility's automatic voltage regulator. Unless otherwise agreed, the test conditions shall include: (1) Large Generating Facility at synchronous speed; (2) automatic voltage regulator on and in voltage control mode; and (3) a five percent change in Large Generating Facility terminal voltage initiated by a change in the voltage regulators reference voltage. Interconnection Customer shall provide validated test recordings showing the responses of Large Generating Facility terminal and field voltages. In the event that direct recordings of these voltages is impractical, recordings of other voltages or currents that mirror the response of the Large Generating Facility's terminal or field voltage are acceptable if information necessary to translate these alternate quantities to actual Large Generating Facility terminal or field voltages is provided. Large Generating Facility testing shall be conducted and results provided to Transmission Owner and ITO for each individual generating unit in a station.

Subsequent to the Operation Date, Interconnection Customer shall provide Transmission Owner and ITO any information changes due to equipment replacement, repair, or adjustment. Transmission Owner shall provide Interconnection Customer any information changes due to equipment replacement, repair or adjustment in the directly connected substation or any adjacent Transmission Owner-owned substation that may affect Interconnection Customer's Interconnection Facilities equipment ratings, protection or operating requirements. The Parties shall provide such information no later than thirty (30) Calendar Days after the date of the equipment replacement, repair or adjustment.

Article 25. Information Access and Audit Rights

25.1 Information Access.

Each Party (the "disclosing Party") shall make available to the other Party information that is in the possession of the disclosing Party and is necessary in order for the other Party to: (i) verify the costs incurred by the disclosing Party for which the other Party is responsible under this LGIA; and (ii) carry out its obligations and responsibilities under this LGIA. The Parties shall not use such

information for purposes other than those set forth in this Article 25.1 and to enforce their rights under this LGIA.

25.2 Reporting of Non-Force Majeure Events.

Each Party (the "notifying Party") shall notify the other Party when the notifying Party becomes aware of its inability to comply with the provisions of this LGIA for a reason other than a Force Majeure event. The Parties agree to cooperate with each other and provide necessary information regarding such inability to comply, including the date, duration, reason for the inability to comply, and corrective actions taken or planned to be taken with respect to such inability to comply. Notwithstanding the foregoing, notification, cooperation or information provided under this article shall not entitle the Party receiving such notification to allege a cause for anticipatory breach of this LGIA.

25.3 Audit Rights.

Subject to the requirements of confidentiality under Article 22 of this LGIA, each Party shall have the right, during normal business hours, and upon prior reasonable notice to the other Party, to audit at its own expense the other Party's accounts and records pertaining to each Party's performance or each Party's satisfaction of obligations under this LGIA. Such audit rights shall include audits of the other Party's costs, calculation of invoiced amounts, Transmission Owner's efforts to allocate responsibility for the provision of reactive support to the Transmission System, Transmission Owner's efforts to allocate responsibility for interruption or reduction of generation on the Transmission System, and each Party's actions in an Emergency Condition. Any audit authorized by this article shall be performed at the offices where such accounts and records are maintained and shall be limited to those portions of such accounts and records that relate to each Party's performance and satisfaction of obligations under this LGIA. Each Party shall keep such accounts and records for a period equivalent to the audit rights periods described in Article 25.4.

25.4 Audit Rights Periods.

25.4.1 Audit Rights Period for Construction-Related Accounts and Records.

Accounts and records related to the design, engineering, procurement, and construction of Transmission Owner's Interconnection Facilities and Network Upgrades shall be subject to audit for a period of twenty-four months following Transmission Owner's issuance of a final invoice in accordance with Article 12.2.

25.4.2 Audit Rights Period for All Other Accounts and Records.

Accounts and records related to each Party's performance or satisfaction of all obligations under this LGIA other than those described in Article 25.4.1 shall be subject to audit as follows: (i) for an audit relating to cost obligations, the applicable audit rights period shall be twenty-four months after the auditing Party's receipt of an invoice giving rise to such cost obligations; and (ii) for an audit relating to all other obligations, the applicable audit rights period shall be twenty-four months after the event for which the audit is sought.

25.5 Audit Results.

If an audit by a Party determines that an overpayment or an underpayment has occurred, a notice of such overpayment or underpayment shall be given to the other Party together with those records from the audit which support such determination.

Article 26. Subcontractors

26.1 General.

Nothing in this LGIA shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this LGIA; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this LGIA in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

26.2 Responsibility of Principal.

The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this LGIA. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall Transmission Owner be liable for the actions or inactions of Interconnection Customer or its subcontractors with respect to obligations of Interconnection Customer under Article 5 of this LGIA. Any applicable obligation imposed by this LGIA upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

26.3 No Limitation by Insurance.

The obligations under this Article 26 will not be limited in any way by any limitation of subcontractor's insurance.

Article 27. Disputes

27.1 Submission.

In the event any Party has a dispute, or asserts a claim, that arises out of or in connection with this LGIA or its performance, such Party (the "disputing Party") shall provide the other Party with written notice of the dispute or claim ("Notice of Dispute"). Such dispute or claim shall be referred to a designated senior representative of each Party for resolution on an informal basis as promptly as practicable after receipt of the Notice of Dispute by the Party. In the event the designated representatives are unable to resolve the claim or dispute through unassisted or assisted negotiations within thirty (30) Calendar Days of the Party's receipt of the Notice of Dispute, such claim or dispute may, upon mutual agreement of the Parties, be submitted to arbitration and resolved in accordance with the arbitration procedures set forth below. In the event the Parties do not agree to submit such claim or dispute to arbitration, each Party may exercise whatever rights and remedies it may have in equity or at law consistent with the terms of this LGIA.

27.2 External Arbitration Procedures.

Any arbitration initiated under this LGIA shall be conducted before a single neutral arbitrator appointed by the Parties. If the Parties fail to agree upon a single arbitrator within ten (10) Calendar Days of the submission of the dispute to arbitration, the Transmission Owner or the Interconnection Customer shall choose one arbitrator who shall sit on a three-member arbitration panel. The two arbitrators so chosen shall within twenty (20) Calendar Days select a third arbitrator to chair the arbitration panel. In either case, the arbitrators shall be knowledgeable in electric utility matters, including electric transmission and bulk power issues, and shall not have any current or past substantial business or financial relationships with any party to the arbitration (except prior arbitration). The arbitrator(s) shall provide each of the Parties an opportunity to be heard and, except as otherwise provided herein, shall conduct the arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association ("Arbitration Rules") and any applicable FERC regulations or RTO rules; provided, however, in the event of a conflict between the Arbitration Rules and the terms of this Article 27, the terms of this Article 27 shall prevail.

27.3 Arbitration Decisions.

Unless otherwise agreed by the Parties, the arbitrator(s) shall render a decision within ninety (90) Calendar Days of appointment and shall notify the Parties in writing of such decision and the reasons therefor. The arbitrator(s) shall be authorized only to interpret and apply the provisions of this LGIA and shall have no power to modify or change any provision of this Agreement in any manner. The decision of the arbitrator(s) shall be final and binding upon the Parties, and judgment on the award may be entered in any court having jurisdiction. The decision of the arbitrator(s) may be appealed solely on the grounds that the conduct of the arbitrator(s), or the decision itself, violated the standards set forth in the Federal Arbitration Act or the Administrative Dispute Resolution Act. The final decision of the arbitrator must also be filed with FERC if it affects jurisdictional rates, terms and conditions of service, Interconnection Facilities, or Network Upgrades.

27.4 Costs.

Each Party shall be responsible for its own costs incurred during the arbitration process and for the following costs, if applicable: (1) the cost of the arbitrator chosen by the Party to sit on the three member panel and one half of the cost of the third arbitrator chosen; or (2) one half the cost of the single arbitrator jointly chosen by the Parties.

Article 28. Representations, Warranties, and Covenants

28.1 General.

Each Party makes the following representations, warranties and covenants:

28.1.1 Good Standing.

Such Party is duly organized, validly existing and in good standing under the laws of the state in which it is organized, formed, or incorporated, as applicable; that it is qualified to do business in the

state or states in which the Large Generating Facility, Interconnection Facilities and Network Upgrades owned by such Party, as applicable, are located; and that it has the corporate power and authority to own its properties, to carry on its business as now being conducted and to enter into this LGIA and carry out the transactions contemplated hereby and perform and carry out all covenants and obligations on its part to be performed under and pursuant to this LGIA.

28.1.2 Authority.

Such Party has the right, power and authority to enter into this LGIA, to become a Party hereto and to perform its obligations hereunder. This LGIA is a legal, valid and binding obligation of such Party, enforceable against such Party in accordance with its terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization or other similar laws affecting creditors' rights generally and by general equitable principles (regardless of whether enforceability is sought in a proceeding in equity or at law).

28.1.3 No Conflict.

The execution, delivery and performance of this LGIA does not violate or conflict with the organizational or formation documents, or bylaws or operating agreement, of such Party, or any judgment, license, permit, order, material agreement or instrument applicable to or binding upon such Party or any of its assets.

28.1.4 Consent and Approval.

Such Party has sought or obtained, or, in accordance with this LGIA will seek or obtain, each consent, approval, authorization, order, or acceptance by any Governmental Authority in connection with the execution, delivery and performance of this LGIA, and it will provide to any Governmental Authority notice of any actions under this LGIA that are required by Applicable Laws and Regulations.

Article 29. Joint Operating Committee

29.1 Joint Operating Committee.

Transmission Owner and Interconnection Customer shall constitute a Joint Operating Committee to coordinate operating and technical considerations of Interconnection Service. At least six (6) months prior to the expected Initial Synchronization Date, Interconnection Customer and Transmission Owner shall each appoint one representative and one alternate to the Joint Operating Committee. Each Interconnection Customer shall notify Transmission Owner of its appointment in writing. Such appointments may be changed at any time by similar notice. The Joint Operating Committee shall meet as necessary, but not less than once each calendar year, to carry out the duties set forth herein. The Joint Operating Committee shall hold a meeting at the request of each Party, at a time and place agreed upon by the representatives. The Joint Operating Committee shall perform all of its duties consistent with the provisions of this LGIA. Each Party shall cooperate in providing to the Joint Operating Committee all information required in the performance of the Joint Operating

Committee's duties. All decisions and agreements, if any, made by the Joint Operating Committee, shall be evidenced in writing. The duties of the Joint Operating Committee shall include the following:

29.1.1 Establish data requirements and operating record requirements.

29.1.2 Review the requirements, standards, and procedures for data acquisition equipment, protective equipment, and any other equipment or software.

29.1.3 Annually review the one (1) year forecast of maintenance and planned outage schedules of Transmission Owner's and Interconnection Customer's facilities at the Point of Interconnection.

29.1.4 Coordinate the scheduling of maintenance and planned outages on the Interconnection Facilities, the Large Generating Facility and other facilities that impact the normal operation of the interconnection of the Large Generating Facility to the Transmission System.

29.1.5 Ensure that information is being provided by each Party regarding equipment availability.

29.1.6 Perform such other duties as may be conferred upon it by mutual agreement of the Parties.

Article 30. Miscellaneous

30.1 Binding Effect.

This LGIA and the rights and obligations hereof, shall be binding upon and shall inure to the benefit of the successors and assigns of the Parties hereto.

30.2 Conflicts.

In the event of a conflict between the body of this LGIA and any attachment, appendices or exhibits hereto, the terms and provisions of the body of this LGIA shall prevail and be deemed the final intent of the Parties.

30.3 Rules of Interpretation.

This LGIA, unless a clear contrary intention appears, shall be construed and interpreted as follows: (1) the singular number includes the plural number and vice versa; (2) reference to any person includes such person's successors and assigns but, in the case of a Party, only if such successors and assigns are permitted by this LGIA, and reference to a person in a particular capacity excludes such person in any other capacity or individually; (3) reference to any agreement (including this LGIA), document, instrument or tariff means such agreement, document, instrument, or tariff as amended or modified and in effect from time to time in accordance with the terms thereof and, if applicable, the terms hereof; (4) reference to any Applicable Laws and Regulations means such Applicable Laws and Regulations as amended, modified, codified, or reenacted, in whole or in part, and in effect from time to time, including, if applicable, rules and regulations promulgated thereunder; (5) unless expressly stated otherwise, reference to any Article, Section or Appendix means such Article of this LGIA or such Appendix to this LGIA, or such Section to the LGIP or such Appendix to the LGIP, as the case may be; (6) "hereunder", "hereof", "herein", "hereto" and words of similar import shall be deemed references to this LGIA as a whole and not to any particular Article or other provision hereof or thereof; (7) "including" (and

with correlative meaning "include") means including without limiting the generality of any description preceding such term; and (8) relative to the determination of any period of time, "from" means "from and including", "to" means "to but excluding" and "through" means "through and including".

30.4 Entire Agreement.

This LGIA, including all Appendices and Schedules attached hereto, constitutes the entire agreement between the Parties with reference to the subject matter hereof, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this LGIA. There are no other agreements, representations, warranties, or covenants which constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under this LGIA.

30.5 No Third Party Beneficiaries.

This LGIA is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

30.6 Waiver.

The failure of a Party to this LGIA to insist, on any occasion, upon strict performance of any provision of this LGIA will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

Any waiver at any time by either Party of its rights with respect to this LGIA shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this LGIA. Termination or Default of this LGIA for any reason by Interconnection Customer shall not constitute a waiver of Interconnection Customer's legal rights to obtain an interconnection from Transmission Owner. Any waiver of this LGIA shall, if requested, be provided in writing.

30.7 Headings.

The descriptive headings of the various Articles of this LGIA have been inserted for convenience of reference only and are of no significance in the interpretation or construction of this LGIA.

30.8 Multiple Counterparts.

This LGIA may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

30.9 Amendment.

The Parties may by mutual agreement amend this LGIA by a written instrument duly executed by the Parties.

30.10 Modification by the Parties.

The Parties may by mutual agreement amend the Appendices to this LGIA by a written instrument duly executed by the Parties. Such amendment shall become effective and a part of this LGIA upon satisfaction of all Applicable Laws and

Regulations.

30.11 Reservation of Rights.

Transmission Owner shall have the right to make a unilateral filing with FERC to modify this LGIA with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation under section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder, and Interconnection Customer shall have the right to make a unilateral filing with FERC to modify this LGIA pursuant to section 206 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by any other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this LGIA shall limit the rights of the Parties or of FERC under sections 205 or 206 of the Federal Power Act and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

30.12 No Partnership.

This LGIA shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. A Party shall not have a right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

IN WITNESS WHEREOF, the Parties have executed this LGIA in duplicate originals, each of which shall constitute and be an original effective Agreement between the Parties.


Louisville Gas & Electric and Kentucky Utilities Company MRD

By: _____

Title: _____

Date: _____

Interconnection Customer

By:  _____

Title: President _____

Date: August 29, 2023 _____

APPENDICES TO LGIA

Appendix A	Interconnection Facilities, Network Upgrades, Distribution Upgrades
Appendix B	Milestones
Appendix C	Interconnection Details
Appendix D	Security Arrangements Details
Appendix E	Commercial Operation Date
Appendix F	Addresses for Delivery of Notices and Billings
Appendix G	Interconnection Requirements for a Wind Generating Plant
Appendix H	Civil Specification
Appendix I	Facilities Study Report

Appendix A to LGIA Interconnection Facilities, Network Upgrades and Distribution Upgrades

Interconnection Customer's Generating Facility located in Ballard County, Kentucky consists of a solar photovoltaic (PV), inverter-based array, with a nominal net capacity of 104MWac at the Point of Interconnection.

In accordance with the provisions of Article 4.1.2, Interconnection Customer has selected Network Resource Interconnection Service (NRIS). The Parties acknowledge that for NRIS to be provided for 104 MW, all of the facilities set forth below must be constructed and placed into operation prior to the initial synchronization of the Generating Facility to the transmission system. Furthermore, if the Agreement is suspended by the Interconnection Customer for any reason (e. g., Article 5.16), additional Interconnection Studies and/or an amendment to the Agreement may be required.

The cost estimates provided below are based on a three (3) breaker ring bus interconnection configuration into the existing LG&E/KU owned Grahamville to Wickcliffe 161kV line as shown in Exhibit 1 in Appendix C and the following assumptions. The total project cost originally documented in the Facilities Study report was estimated to be within +/- 20% accuracy and was based on a projected In-Service Date of June 1, 2023. The costs shown below in Table 1 and Table 2 are reflective of an updated estimate where the Generating Facility's Commercial Operation Date is September 30, 2026.

- No costs are included in this estimate for the following (which are obligations and cost responsibilities of the Interconnection Customer):
 - Land or easement purchase
 - Clearing, grading, erosion control, or any environmental requirements
 - Permitting
 - Substation access road
 - Substation perimeter fencing to LG&E/KU specifications
 - Construction of generator lead line from the generator location to the Point of Change of Ownership at the interconnection station (new or existing)
- A portion of the costs account for utility burden rates which vary over time.

Interconnection Customer shall provide site acceptable to LG&E/KU for the new interconnection substation with all ingress/egress rights. Substation location, excavation, grading, erosion control, and access to be provided by the Interconnection Customer in accordance with LG&E/KU Civil Specifications guidelines, which are included in Appendix H. The Interconnection Customer shall i) provide an easement acceptable in form to LG&E/KU or ii) purchase the substation property for the interconnection substation and transfer ownership of the easement or deed the property over to LG&E/KU or shall make and provide such other suitable arrangement such as a permanent easement meeting the specifications and requirements of LG&E/KU.

The engineering, design, and construction of the interconnection facilities and network upgrades is estimated to take twenty-four (24) months from receipt of the Interconnection Customer's notice to proceed and payment of the applicable security and deposits. This estimated timeline assumes the Interconnection Customer will provide the Preliminary Requirements as outlined in Appendix H of this LGIA within three (3) months of receipt of Customer's notice to proceed and will provide a build-ready site in accordance with Appendix H of this LGIA within twelve (12) months of Interconnection Customer's notice to proceed. Additionally, this estimate assumes that the project schedule would not be impacted by storm damage and restoration, time of year limitations, permitting issues, outage scheduling, system emergencies, and contractor and equipment availability, or other unforeseen circumstances. In particular, outage scheduling on the 161kV interconnection line will require additional coordination, that could impact the 24 month timeframe.

The Point of Interconnection shall be the point where the Transmission Owner's Interconnection Facilities connect to the 161kV bus at the new switching station as shown on Exhibit 2 of Appendix C.

The metering point shall be at the Point of Interconnection as shown on Exhibit 2 of Appendix C.

Customer must work with the TO to provide relay settings as identified in the SIS and Facility Study (see table 2-2-A in the Facility Study report). Interconnection to LG&E/KU system is also contingent on steady state, short circuit and dynamic model, assumptions and settings used in the SIS and facilities study.

1. Interconnection Facilities:

(a) Interconnection Customer's Interconnection Facilities:

The Interconnection Customer's Interconnection Facilities are those on the Interconnection Customer's side of the Point of Change of Ownership (as shown in Exhibit 1 of Appendix C) which shall be at the point where Generating Facility or and its intermediate equipment connect to the Generating Facility's side of the motor operated disconnect switches located just prior to 161kv metering equipment. The Interconnection Customer is responsible for building, owning, and maintaining these assets.

The new interconnection facility will be constructed adjacent to the IC's collector substation. The IC will be responsible for the design, construction, and permitting of the 161kV transmission line from their facilities to the Point of Change of Ownership (PCO) at the GI-2019-002 Solar Station including any and all cost required to maintain adequate clearances to other LG&E/KU lines and equipment along the path of the customer owned line up to the PCO.

Interconnection Customer will provide two fiber optic circuits (one for relay coordination and one for data exchange) from the generating facility to the Transmission Owners control house.

Interconnection Customer will provide "as built" drawings and information and documents about its Interconnection Facilities which shall include, but not be limited to:

- Single line relaying and metering;
- Three line diagram;
- Communication schematics;
- DC Schematics;
- Cable schedule;
- Conduit/cable trench plan and details;
- Conduit schedule;
- Site survey;
- Geotechnical studies;
- Grounding plan and details;
- General arrangement and section views;
- Schematic of the PV/Inverter system;
- Inverter data/settings describing its output response (Current/Voltage); and
- GSU data sufficient to model positive and zero sequence impedance.

All specifications provided above shall be deemed confidential.

(b) Transmission Owner's Interconnection Facilities:

The Transmission Owner's Interconnection Facilities are those facilities located

between the Point of Change of Ownership and the Point of Interconnection (as shown in Exhibit 1 of Appendix C). The Transmission Owner's Interconnection Facilities will be designed to adequately support 104 MW of NRIS for the Generating Facility. The Transmission Owner is responsible for building, owning, and maintaining these assets. The Interconnection Customer bears the non-refundable expense for these assets. The non-binding cost estimate for the Transmission Owner's Interconnection Facilities is shown in table 1 and is based on and subject to the assumptions and comments in the FS-LGE-GIS-2019-002 Facilities Study Report dated May 29, 2020. The non-binding cost estimate for the Transmission Owner's Interconnection Facilities includes the following:

High Voltage

- One (1) 161kV Motor-Operated Disconnect Switch
- Three (3) 161kV Surge Arresters
- Three (3) 161kV Metering PTs
- Three (3) 161kV Metering CTs

Civil/Structural

- One (1) Steel A-Frame structure
- Six (6) 1-Phase CCVT Supports

Protection & Control

- One (1) New Control House Space Allocation consisting of below relay panels:
 - line protection panel for GI Interconnect
 - metering panel for GI
 - RTU panel
 - AC/DC systems

Table 1

Transmission Owner’s Interconnection Facilities Cost Estimate

Description	Cost
Company Labor	\$27,000
Contract Labor	\$265,000
Materials	\$472,000
Contingency/Burdens	\$170,000
Total	\$934,000

The Interconnection Customer will provide security that meets the requirements specified in Article 11.5 of this LGIA in a form acceptable to LG&E/KU. The Interconnection Customer will reimburse LG&E/KU for all actual costs incurred within thirty (30) days of receiving the invoice for actual costs, at which point LG&E/KU will release the Interconnection Customer’s provided security. Transmission Owner will use commercially reasonable efforts to keep costs from exceeding the cost estimate.

Transmission Owner will provide “as built” drawings and information and documents about its Interconnection Facilities which shall include, but not be limited to:

- System Protection Facilities;
- Communication scheme / configuration;
- Metering scheme / configuration;
- Grounding scheme / configuration;
- Transmission Line and Substation Connection configurations; and
- Equipment ratings.

All specifications provided above shall be deemed confidential.

2. Network Upgrades:

(a) Stand Alone Network Upgrades:

None

(b) Other Network Upgrades:

The Network Upgrades are the additions, modifications, and upgrades to the Transmission Owner’s Transmission System required at or beyond the Point of Interconnection to accommodate the interconnection with the Transmission Owner’s Transmission System (as shown in Exhibit 1 of Appendix C). The Transmission Owner is responsible for building, owning, and maintaining these assets. The Interconnection Customer will provide security that meets the requirements specified in Section 11.5 in a form acceptable to LG&E/KU. The

non-binding cost estimate for the Transmission Owner's Interconnection Facilities is shown in table 2 and is based on and subject to the assumptions and comments in the FS-LGE-GIS-2019-002 Facilities Study Report dated May 29, 2020. The non-binding cost estimate for the Network Upgrades includes the following:

The new network interconnection facility will be a three breaker ring bus arrangement with three 161kV lines (Grahamville, Wickcliffe, & GI Interconnect) and the following equipment

High Voltage

- Three (3) 161kV Circuit Breakers
- Six (6) 161kV Manually Operated Disconnect Switches
- Six (6) 161kV Surge Arresters
- Six (6) 161kV CCVTs
- Two (2) 161kV SSVTs

Civil/Structural

- Two (2) Steel H-Frame structures
- Five (5) 3-Phase High Bus Supports
- Twelve (12) 1-Phase Low Bus Supports
- Six (6) Switch Support Stands
- Six (6) 1-Phase CCVT Supports
- Two (2) SSVT Supports
- One (1) Lightning Mast

Protection & Control

- One (1) Small (14' x 42') control house consisting of the following relay panels:
 - (2) line protection panels for Grahamville & Wickcliffe & GI Interconnect
 - (2) Digital communications paths, (1) associated with the Grahamville line and (1) associated with the Wickcliffe line
- (1) RTU panel
- (1) DFR panel
- AC/DC systems

- One (1) line protection replacement panel at Wickcliffe

Transmission Lines

- Four (4) 161kV three (3) pole steel dead end structures and foundations
- Hardware and Conductor for taps from existing 161kV line to the station structure
- Estimate assumes that the substation will be offset to one side of the existing 161 kV transmission line, located within 200 feet of the existing right of way, and will allow the transmission line structures to be guyed steel poles.

Telecommunication Facilities

- One (1) 195’ tall Microwave tower and foundations
- Antennae systems
- MW Radio HS Terminal
- Digital Multiplex Systems and Channels
- DC Power

Table 2
Network Upgrades Cost Estimate

Description	Cost
Company Labor	\$535,000
Contract Labor	\$3,686,000
Materials	\$3,303,000
Contingency/Burdens	\$1,824,000
Total	\$9,348,000

The Interconnection Customer will provide security that meets the requirements specified in Article 11.5 of this LGIA in a form acceptable to LG&E/KU. Transmission Owner will use commercially reasonable efforts to keep costs from exceeding the cost estimate. Upon the Generating Facility reaching Commercial Operation, LG&E/KU will release the Interconnection Customer’s provided security.

3. Distribution Upgrades:

None

4. Contingent Facilities

Other than as listed above, there are no contingent facilities that are needed to

provide Interconnection Service.

5. Affected Systems

No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request.

Appendix B to LGIA Milestones

The Transmission Owner shall use the Standard Option under Article 5.1.1 (Standard Option) to design, procure and construct Transmission Owner’s Interconnection Facilities and Network Upgrades. Transmission Owner is not responsible for construction, performance of work, or for making any arrangements with any third parties, related to any facilities that are the Interconnection Customer’s responsibility (e.g., Interconnection Customer’s Interconnection Facilities and facilities owned by third party parties such as Affected Systems); provided, however, that the Transmission Owner shall coordinate with Affected Systems as required by FERC policy.

Originally Requested Commercial Operation Date: June 1, 2022

Updated and Accepted Commercial Operation Date: September 30, 2026

Critical milestones and responsibility as agreed to by the Parties:

Item No.	Milestone Description	Responsible Party	Date*	LGIP/LGIA Reference
1	Provide signed certificate of insurance	Interconnection Customer and Transmission Owner	Within ten (10) days following execution of this LGIA, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) days thereafter	§ 18.3.9 of LGIA
2	Provide evidence of continued Site Control to Transmission Owner, or \$250,000 non-refundable deposit to Transmission Owner.	Interconnection Customer	Within 15 Business Days of final LGIA receipt	§ 11.3 of LGIP
3	Provide evidence to Transmission Owner that one or more of the following milestones in development of the Large Generating Facility has been achieved: (i) the execution of a contract for the	Interconnection Customer	Within 15 Business Days of final LGIA receipt	§ 11.3 of LGIP

	supply or transportation of fuel to the Large Generating Facility; (ii) the execution of a contract for the supply of cooling water to the Large Generating Facility; (iii) execution of a contract for the engineering for, procurement of major equipment for, the Large Generating Facility; (iv) execution of a contract for the sale of electric energy or capacity from the Large Generating Facility; or (v) application for an air, water, or land use permit.			
4	Provide written authorization to Transmission Owner to proceed with design, equipment procurement and construction of Transmission Interconnection Facilities	Interconnection Customer	On or before 12/4/2023.	§ 5.5.1 and § 5.6.3 of LGIA
5a	Provision of Security to Transmission Owner pursuant to Section 11.5 of LGIA for Phase 1 Transmission Owner's Interconnection Facilities and Network Upgrades listed in Tables 1 and 2 of Appendix A in the amount of \$4,578,395.	Interconnection Customer	Concurrent with Milestone 4.	§§ 5.5.2 and 5.6.4 of LGIA
5b	Provision of Security to Transmission Owner pursuant to Section 11.5 of LGIA for Phase 2 Transmission Owner's Interconnection Facilities and Network Upgrades listed in Tables 1 and 2 of Appendix A in the amount of \$5,703,605.	Interconnection Customer	Twelve (12) months after Milestone 4	§§ 5.5.2 and 5.6.4 of LGIA
6	Provision of security for cost consequences of tax liabilities, and reimbursement of Transmission Owner's costs pursuant to Section 5.17 <i>et seq.</i> of LGIA	Interconnection Customer	Within 30 Calendar Days of receiving notice of amount due and how amount was calculated	§ 5.17.3 of LGIA
7	Provide initial design and specification for Interconnection Customer's Interconnection Facilities to Transmission Owner	Interconnection Customer	180 Calendar Days prior to Initial Synchronization Date	§ 5.10.1 of LGIA

8	Provide final design and specification for Interconnection Customer's Interconnection Facilities to Transmission Owner	Interconnection Customer	90 Calendar Days prior to Initial Synchronization Date	§ 5.10.1 of LGIA
9	Deliver to Transmission Owner "as-built" drawings, information, and documents regarding Interconnection Customer's Interconnection Facilities	Interconnection Customer	Within 120 Calendar Days of Commercial Operation Date	§ 5.10.3 of LGIA
10	Commencement of Construction Interconnection Facilities	Transmission Owner	As may be agreed to by the Parties	§ 5.6 of LGIA
11	Deliver to Interconnection Customer "as-built" drawings, information, and documents regarding Transmission Owner's Interconnection Facilities	Transmission Owner	Within 120 Calendar Days after Commercial Operation Date	§ 5.11 of LGIA
12	Provide Interconnection Customer final cost invoices	Transmission Owner	Within 6 months after completion	§ 12.2 of LGIA
13	Refund any excess payment over the actual cost of construction to Interconnection Customer	Transmission Owner	Within 30 Calendar Days of the issuance of the final construction invoice	§ 12.2 of LGIA
14	Submit information regarding the electrical characteristics of facilities, including Transmission System Information necessary to allow Interconnection Customer to select equipment and meet any system protection and stability requirements to Interconnection Customer	Transmission Owner	At least 180 Calendar Days prior to Trial Operation	§ 24.2 of LGIA
15	Provide Interconnection Customer and ITO with a status report on the construction and installation of Transmission Owner's Interconnection Facilities and Network Upgrades, including, but not limited to, the following: (1) progress to date; (2) a description of the activities since the last report; (3) a description of the action items for the next period; and (4) the delivery status of equipment ordered.	Transmission Owner	On a monthly basis	§ 24.2 of LGIA

16	Provide the Transmission Owner and ITO updated information, including manufacturer information, an updated copy of the Large Generating Facility data requirements contained in Appendix 1 to the LGIP, and any addition information provided to the ITO for the Feasibility Study and to the Transmission Owner for the Facilities Study.	Interconnection Customer	At least 180 Calendar Days prior to Trial Operation	§ 24.3 of LGIA
17	Provide relevant information about equipment replacement, repair, or adjustment	Interconnection Customer, Transmission Owner	Within 30 Calendar Days after the date of equipment replacement, repair, or adjustment	§ 24.4 of LGIA
18	Parties to each appoint one representative and one alternate to the Joint Operating Committee and notify the other party in writing of its selection	Interconnection Customer, Transmission Owner	At least 6 months prior to expected Initial Synchronization Date	§ 29.1 of LGIA
19	Pre-energization meeting	Interconnection Customer, Transmission Owner	As may be agreed by the parties.	
20	In-Service Date (Transmission Owner's Interconnection Facilities and Network Upgrades)	Interconnection Customer	January 4, 2026	
21	Initial Synchronization Date	Interconnection Customer	5/1/2026	
22	Commercial Operation Date	Interconnection Customer	9/30/2026	

* The milestone dates in this Appendix B of this Amended LGIA are demonstrative of the customer taking their fully allowed three years of suspension in accordance with Article 5.16. The Interconnection Customer will not receive any further suspension rights associated with this Amended LGIA.

Agreed to by:

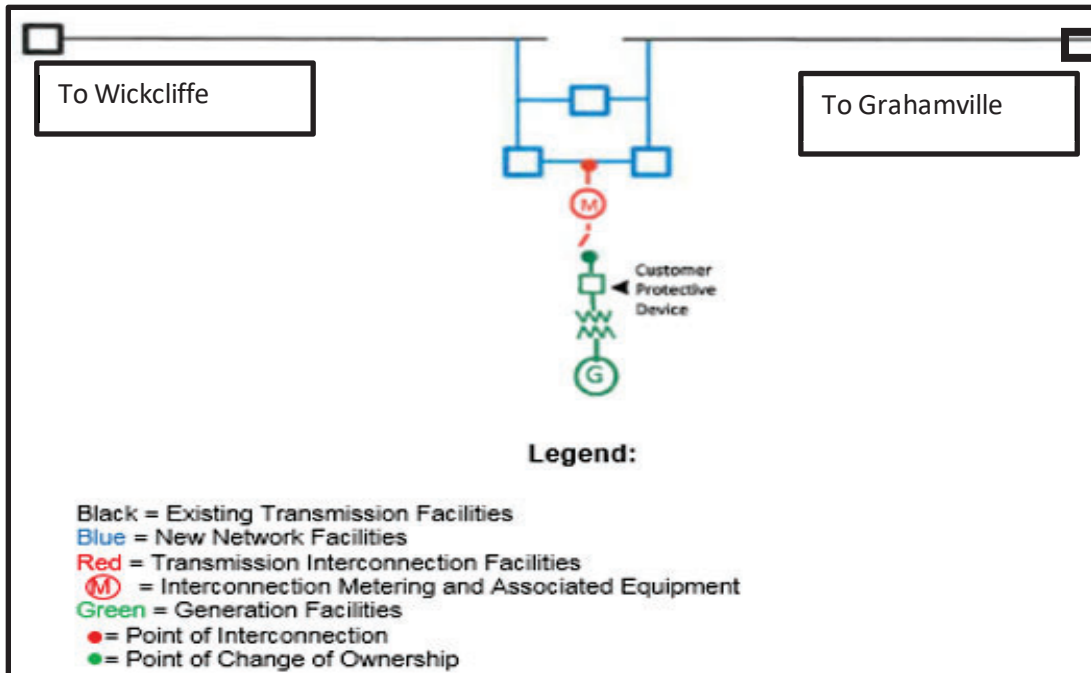
For the Transmission Owner _____ Date _____ MRD

For the Interconnection Customer  Date August 29, 2023

Appendix C to LGIA Interconnection Details for LGI-GIS-2019-002

This request seeks to interconnect a 104MWac Solar generating facility to the existing LG&E/KU Grahamville to Wickcliffe 161kV line via a new three breaker ring bus switching station. The proposed facility is a ground-mounted solar photovoltaic array generating facility. The solar array will be installed on the agricultural acreage with solar panels connected in series producing DC power. The DC power will be collected through a collection system and will be inverted to AC through multiple central inverters (as can be seen in the single-line diagram). The output of the inverters will be collected to a central point of interconnection where the AC voltage will be stepped up to the line voltage of 161 kV. The system will have all of the necessary safety protections and operating capabilities necessary for a safe interconnection that does not compromise grid stability.

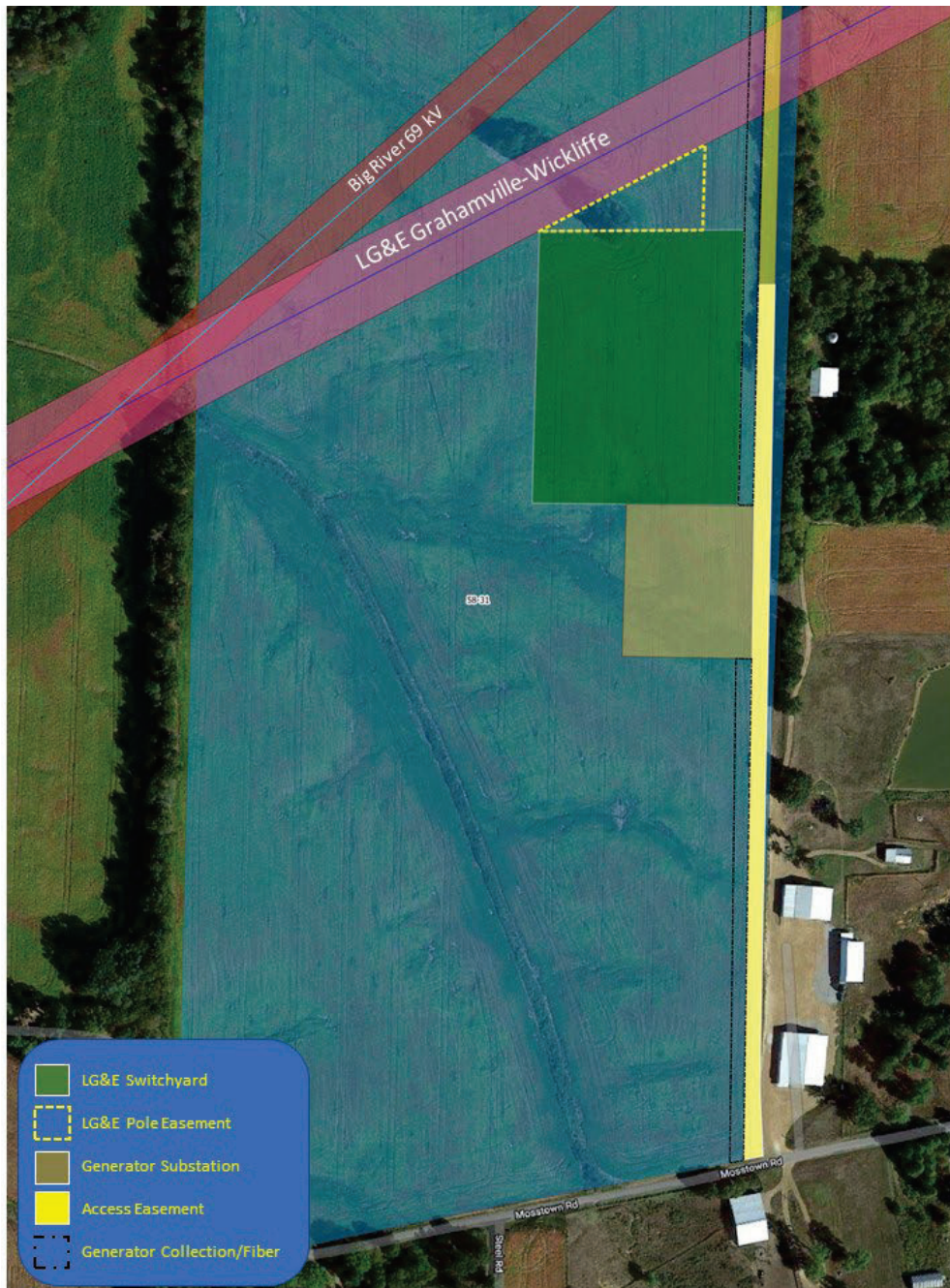
Exhibit 1



Any upgrades required beyond the Points of Interconnection would be considered Network Upgrades

Exhibit 2 shows the high level overview and location of the proposed new 161 kV switching station on the Grahamville to Wickcliffe 161kV line. The representation in Exhibit 2 is conceptual and not to scale. The final layout/orientation will be determined during detailed design.

Exhibit 2



Additional Details:

LGIA, Section 8.4: No information is required at this time. The Parties agree that if it is determined in the future that additional information is necessary for reliable transmission operations, the Parties agree to coordinate such information exchange.

Transmission Owner agrees to allow for the injection of test energy on or around the Initial Synchronization Date, as feasible. Interconnection Customer shall arrange for any necessary transmission service to accommodate the injection of test energy in accordance with the Tariff. Nothing herein obligates the Transmission Owner to purchase test energy.

The customer must work with the TO to determine mutually agreeable relay settings as identified in the Facilities Study report in Tables 2-2-A and 2-2-B.

Appendix D to LGIA Security Arrangements Details

Infrastructure security of Transmission System equipment and operations and control hardware and software is essential to ensure day-to-day Transmission System reliability and operational security. FERC will expect all public utilities, market participants, and Interconnection Customers interconnected to the Transmission System to comply with the recommendations offered by the President's Critical Infrastructure Protection Board and, eventually, best practice recommendations from the electric reliability authority. All public utilities will be expected to meet basic standards for system infrastructure and operational security, including physical, operational, and cyber-security practices.

**Appendix E to LGIA
Commercial Operation Date**

This Appendix E is a part of the LGIA between Transmission Owner and Interconnection Customer.

[Date]
[Transmission Owner address]

Re: _____ Large Generating Facility

Dear _____:

On **[Date]** **[Interconnection Customer]** has completed Trial Operation of Unit No.

_____.
This letter confirms that **[Interconnection Customer]** commenced Commercial Operation of Unit No. ____ at the Large Generating Facility, effective as of **[Date plus one day]**.

Thank you.
[Signature]
[Interconnection Customer Representative]

**Appendix F to LGIA
Addresses for Delivery of Notices and Billings Notices:**

Notices:

ITO:

TranServ International
General Counsel
7901 Computer Avenue
Bloomington, MN 55435

Transmission Owner:

Ashley Vinson
Manager, Transmission Policy & Tariffs
LG&E/KU
220 W. Main Street
Louisville, KY 40202
Office: (502) 627-3278
Cell: (502) 214-0950
Ashley.Vinson@lge-ku.com

Interconnection Customer:

Song Sparrow Solar LLC
100 California Street, Suite 400
San Francisco, CA 94111
Attn: Marc Gagne
Cell: (860) 810-9529
Marc.Gagne@clearwayenergy.com

With Copies to:

Song Sparrow Solar LLC
5780 Fleet Street, Suite 130
Carlsbad, CA 92008
Phone: (760) 710-2187
Legal@clearwayenergy.com

Billings and Payments:

Transmission Owner:

Ashley Vinson
Manager, Transmission Policy & Tariffs
LG&E/KU
220 W. Main Street
Louisville, KY 40202
Office: (502) 627-3278

Cell: (502) 214-0950
Ashley.Vinson@lge-ku.com

Interconnection Customer:
Song Sparrow Solar LLC
100 California Street, Suite 400
San Francisco, CA 94111
Attn: Marc Gagne
Cell: (860) 810-9529
Marc.Gagne@clearwayenergy.com

Alternative Forms of Delivery of Notices (telephone, facsimile or email):

ITO:
TranServ International
General Counsel
7901 Computer Avenue
Bloomington, MN 55435
Phone: (763) 205-7099

Transmission Owner:
Ashley Vinson
Manager, Transmission Policy & Tariffs
LG&E/KU
220 W. Main Street
Louisville, KY 40202
Office: (502) 627-3278
Cell: (502) 214-0950
Ashley.Vinson@lge-ku.com

Interconnection Customer:
Song Sparrow Solar LLC
100 California Street, Suite 400
San Francisco, CA 94111
Attn: Marc Gagne
Cell: (860) 810-9529
Marc.Gagne@clearwayenergy.com

**Appendix G to LGIA
Interconnection Requirements for a Wind Generating Plant**

Appendix G sets forth requirements and provisions specific to a wind generating plant. All other requirements of this LGIA continue to apply to wind generating plant interconnections.

A. Technical Standards Applicable to a Wind Generating Plant

i. Low Voltage Ride-Through (LVRT) Capability

A wind generating plant shall be able to remain online during voltage disturbances up to the time periods and associated voltage levels set forth in the standard below. The LVRT standard provides for a transition period standard and a post-transition period standard.

Transition Period LVRT Standard

The transition period standard applies to wind generating plants subject to FERC Order 661 that have either: (i) interconnection agreements signed and filed with the Commission, filed with the Commission in unexecuted form, or filed with the Commission as non-conforming agreements between January 1, 2006 and December 31, 2006, with a scheduled in-service date no later than December 31, 2007, or (ii) wind generating turbines subject to a wind turbine procurement contract executed prior to December 31, 2005, for delivery through 2007.

1. Wind generating plants are required to remain in-service during three-phase faults with normal clearing (which is a time period of approximately 4 - 9 cycles) and single line to ground faults with delayed clearing, and subsequent post-fault voltage recovery to prefault voltage unless clearing the fault effectively disconnects the generator from the system. The clearing time requirement for a three-phase fault will be specific to the wind generating plant substation location, as determined by and documented by the Transmission Owner. The maximum clearing time the wind generating plant shall be required to withstand for a three-phase fault shall be 9 cycles at a voltage as low as 0.15 p.u., as measured at the high side of the wind generating plant step-up transformer (i.e. the

transformer that steps the voltage up to the transmission interconnection voltage or “GSU”), after which, if the fault remains following the location-specific normal clearing time for three-phase faults, the wind generating plant may disconnect from the transmission system.

2. This requirement does not apply to faults that would occur between the wind generator terminals and the high side of the GSU or to faults that would result in a voltage lower than 0.15 per unit on the high side of the GSU serving the facility.
3. Wind generating plants may be tripped after the fault period if this action is intended as part of a special protection system.
4. Wind generating plants may meet the LVRT requirements of this standard by the performance of the generators or by installing additional equipment (e.g., Static VAR Compensator, etc.) within the wind generating plant or by a combination of generator performance and additional equipment.
5. Existing individual generator units that are, or have been, interconnected to the network at the same location at the effective date of the Appendix G LVRT Standard are exempt from meeting the Appendix G LVRT Standard for the remaining life of the existing generation equipment. Existing individual generator units that are replaced are required to meet the Appendix G LVRT Standard.

Post-transition Period LVRT Standard

All wind generating plants subject to FERC Order No. 661 and not covered by the transition period described above must meet the following requirements:

1. Wind generating plants are required to remain in-service during three-phase faults with normal clearing (which is a time period of approximately 4 - 9 cycles) and single line to ground faults with delayed clearing, and subsequent post-fault voltage recovery to

prefault voltage unless clearing the fault effectively disconnects the generator from the system. The clearing time requirement for a three-phase fault will be specific to the wind generating plant substation location, as determined by and documented by the Transmission Owner. The maximum clearing time the wind generating plant shall be required to withstand for a three-phase fault shall be 9 cycles after which, if the fault remains following the location-specific normal clearing time for three-phase faults, the wind generating plant may disconnect from the transmission system. A wind generating plant shall remain interconnected during such a fault on the transmission system for a voltage level as low as zero volts, as measured at the high voltage side of the wind GSU.

2. This requirement does not apply to faults that would occur between the wind generator terminals and the high side of the GSU.
3. Wind generating plants may be tripped after the fault period if this action is intended as part of a special protection system.
4. Wind generating plants may meet the LVRT requirements of this standard by the performance of the generators or by installing additional equipment (e.g., Static VAR Compensator) within the wind generating plant or by a combination of generator performance and additional equipment.
5. Existing individual generator units that are, or have been, interconnected to the network at the same location at the effective date of the Appendix G LVRT Standard are exempt from meeting the Appendix G LVRT Standard for the remaining life of the existing generation equipment. Existing individual generator units that are replaced are required to meet the Appendix G LVRT Standard.

ii. Power Factor Design Criteria (Reactive Power)

The following reactive power requirements apply only to a newly interconnecting wind

generating plant that has executed a Facilities Study Agreement as of the effective date of the Final Rule establishing the reactive power requirements for non-synchronous generators in section 9.6.1 of this LGIA (Order No. 827). A wind generating plant to which this provision applies shall maintain a power factor within the range of 0.95 leading to 0.95 lagging, measured at the Point of Interconnection as defined in this LGIA, if the ITO's System Impact Study shows that such a requirement is necessary to ensure safety or reliability. The power factor range standard can be met by using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors if agreed to by the Transmission Owner, or a combination of the two. The Interconnection Customer shall not disable power factor equipment while the wind plant is in operation. Wind plants shall also be able to provide sufficient dynamic voltage support in lieu of the power system stabilizer and automatic voltage regulation at the generator excitation system if the System Impact Study shows this to be required for system safety or reliability.

iii. Supervisory Control and Data Acquisition (SCADA) Capability

The wind plant shall provide SCADA capability to transmit data and receive instructions from the Transmission Owner to protect system reliability. The Transmission Owner and the wind plant Interconnection Customer shall determine what SCADA information is essential for the proposed wind plant, taking into account the size of the plant and its characteristics, location, and importance in maintaining generation resource adequacy and transmission system reliability in its area.

Appendix H to LGIA Civil Specifications

GENERAL REQUIREMENTS

1. All safety and controls are the responsibility of contractor.
2. Protection of work site and property is responsibility of contractor.
3. Security of site during work is responsibility of contractor. Long term required security will be provided by contractor during turn over. This will include required fencing and barriers needed for safety and protection of assets. The plan will be reviewed and approved by LG&E/KU.
4. All erosion control during construction shall be by the contractor. Site will have long term erosion control measures in place when grading is done. This includes seeding when needed. Long term erosion control plan developed in accordance with Kentucky Stormwater Pollution Prevention Plan guidelines will be submitted to LG&E/KU for approval.

Definitions

The following terms when used in this specifications shall have the meanings specified below:

1. Company - Louisville Gas & Electric and Kentucky Utilities. (LLG&E/KU)
2. Contract - The General Terms and Conditions of Contract, the Specifications, the Bid, the Purchase Order, all plans and drawings and written instructions and other documents relating to the work to be done under the Contract approved or issued by the Company.
3. Contractor - The person, firm or corporation with whom the Company may enter into contract for the execution of the work herein specified or any part thereof.
4. Work - All services, labor, plant, equipment, materials, supplies, engineering and the like to be furnished by the Contractor at the jobsite and the performance of all operations required for

construction, erection, assembly, installation, completion, testing, and start-up of the facility as described in this Specification.

5. Engineer - The person designated by the contractor to act as project manager for all work covered by this Contract.

CODES, REGULATIONS, AND STANDARDS:

1. All work will comply to the following codes, regulations, and standards:
 - a. IEEE, ASTM, OSHA, NESC, NEC, NFPA and local and regional codes and laws including authorities having jurisdiction. If there is conflicts between the codes the most conservative one will prevail. If the conflict cannot be resolved provide proposed solution to LG&E/KU for approval.

PRELIMINARY REQUIREMENTS

The following lists some of the basic information required by the contractor for the site preparation design and information shall be submitted to LG&E/KU for our records and approval.

1. An agreed upon general arrangement of the substation.
 - a. LG&E and KU must verify a suitable site layout for adherence to spacing standards and access for future maintenance.
2. Area maps (aerial photos if available).
3. Boundary survey with legal description of property.
4. Existing topographic drawing of selected site area showing ground elevations on a grid system at 1-foot minimum spacing. As-built survey with topography will be provided after construction is complete.
5. Existing topographic survey must also include the following:
 - a. Location and elevation of existing roads, railroads, ditch inverts, and culverts.
 - b. Location of pertinent overhead or underground utilities and the exact location and depth of any pipelines.
 - c. Location of the area's drainage exits.
 - d. High water elevation in area, if any.
 - e. Flood zone designation with base flood elevation, if any.
6. Soil borings in immediate site area. All soil borings and geotechnical data will be submitted to LG&E/KU throughout the project.
7. Customers review of state and local government regulations for stormwater management plan requirements. Many local governments have adopted storm drainage criteria and require that stormwater detention or retention basins be provided, and a few require zero discharge from the site. The State of Kentucky requires that projects with disturbed areas greater than 1-acre are

required to develop a Stormwater Pollution Prevention Plan (SWPPP). Any reports or information submitted for permitting shall be submitted to LG&E/KU for review and subject to approval. A copy of all permits and permit reviews shall be supplied to LG&E/KU.

SURFACE AND DRAINAGE SYSTEMS

All required surface and drainage systems will be designed by the contractor. Submit drawings for review and approval before work is started.

The yard will be a sloped or flat yard design. If sloped the slope will be submitted to LG&E/KU for review and approval. Such a system consists of a gently sloping (0.5 percent to 0.75 percent) ground surface so that the water drains to the edge of the yard or to shallow ditches within the yard. The ditches may discharge into culverts or shallow open channels removing the runoff from the yard. A larger slope than listed above is not acceptable.

ROADS AND OTHER ACCESS

General Access Roads

Access roads into substation yards have to be adequate to sustain heavy equipment under all weather conditions including flood conditions. Long access roads require design considerations similar to secondary county or state roads. Any culverts or sewer crossings also need to be designed for anticipated heavy equipment loads. Roads bridges, culverts and all other roadways shall be designed for AASHTO H40 rating and capable of getting a large transmission transformer into the substation. This is required even if a transformer is not in the current design but needed for future substation expansion.

Grade

The maximum grade on the access road should generally not exceed 6 percent.

Curvature

The inside radius of the access road at 90 degree intersections with major roads should not be less than 15 meters (50 feet) in order to provide sufficient turning space for long vehicles.

Design

1. Access roads shall be about 6 meters (20 feet) wide. The road should be crowned at the center for drainage.
2. The subgrade for the road should be prepared and compacted to the same requirements as the embankment for the yard at a minimum.
3. Follow State highway department standard specifications.
4. The access road may consist of a 200 mm (8-inch) aggregate base course and a
5. 100 mm (4-inch) aggregate surface course.
6. Application of the wearing courses should be made in accordance with highway standard specifications.

Roadways in the Substation Yard

1. The entire yard will be considered as drivable by light traffic (AASHTO H20 rating).
2. Drives within the fenced yard for access to transformer banks or as a perimeter drive will be the same as for the access road designs (AASHTO H40).
3. The width may be reduced to 5 meters (16 feet) and inside radii for interior drives may be 7.5 meters (25 feet) or less if space is not available.
4. Culverts and cable trenches should also be designed for anticipated heavy equipment loads (AASHTO H40).

GROUNDING

The site locations shall have good grounding properties. If a poor site is purchased it would raise the costs of the substation to make provisions to correct for poor grounding conditions.

Provide the follow following work and information to LG&E/KU:

1. A geotechnical report including soil types and rock depth at a minimum depth of 10' below proposed final grade or until rock is encountered. If rock is encountered before 10', core 5' of rock. All additional geotechnical reports required for grading and site design will be completed and supplied to LG&E/KU.
2. A soil resistivity study under the proposed yard using the four point Wenner method or smart meter. The measurement should be taken to allow multi-layer resistivity modeling and go to the lowest depth as reasonably possible with a minimum of 15' depth. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval.
3. If the geotechnical report or the resistivity study indicates potential grounding issues with the site, LG&E/KU reserves the right for a resistance to remote ground measurement to be taken with a loss of potential measurement and shall be taken at the maximum distance away as practically possible. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval. A resistance to remote ground measurement is to be taken with a Loss of potential measurement and shall be taken at the maximum distance away as practically possible. This will be completed before site is purchased and after site work is completed. Both are subject of review and approval.

ENVIRONMENTAL

Provide environmental information before the purchase or lease of the land and at any other times new design considerations or hazards are discovered.

Below are a list of minimum requirements.

1. Provide information with geotechnical report at a minimum:
 - a. Surface and bedrock geology
 - b. Slope stability and erosion potential
 - c. Permafrost
 - d. Existing Soil types
 - e. Water quantity (surface and groundwater), including hydrologic regime data and water withdraws.
 - f. Water resources
 - g. Flood levels, zones and relevant information.
2. Provide existing Vegetation types onsite including but not limited to information on:
 - a. Rare and endangered plants
 - b. Revegetation potential
 - c. Other relevant information.
3. Information on wildlife resources including but not limited to:
 - a. Wildlife populations and capabilities
 - b. Sensitive species, periods, and habitat
 - c. Hunting, hiking, and trapping activities
 - d. Wildlife management activities
 - e. Other relevant information.

4. Provide information on site and objects of historical, architectural, archaeological, paleontological, and scenic significance
5. Provide information on environmental hazards
 - a. Known and potential occurrence of hazards, such as snow avalanches, landslides, mudflows, windstorms, earthquakes, tidal waves, floods, and fire hazards
 - b. Existence of toxic or other hazardous materials on site
 - c. Government-owned land, ecological reserves, forest reserves, and other reserves and easements
 - d. Noise potential hazards and design consideration. Special sounds wall requirements.
 - e. Underground objects that may affect grounding or any other below grade work and excavations.
6. Provide information on any special vegetation, landscaping or visual wall required for nearby residents.

CONSTRUCTION AND DESIGN SPECIFICATIONS

1. All construction and design specification will be submitted for LG&E/KU review and is subject to approval to meet company and industry standards.
2. All drawings and equipment cut sheet will be provided to LG&E/KU for review and approval before any work is started. Any changes to the drawings or specifications to meet specifications, codes, permits or industry standards will be at the cost of the contractor.
3. The specifications listed in this document are minimum requirements. The contractor is responsible for all design and specifications for a complete and working system.

SITE PREPARATION AND EARTHWORK GENERAL SPECIFICATIONS.

Definitions

1. Backfill: Soil materials used to fill an excavation.
 - a. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - b. Final Backfill: Backfill placed over initial backfill to fill a trench.
2. Base Course: Layer placed between the subgrade and asphalt or concrete paving.
3. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
4. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
5. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of water.
6. Excavation: Removal of material encountered above subgrade elevations and removal of material below subgrade for foundations, trenches, drains, and tanks.
 - a. Additional Excavation: Excavation below indicated elevations when directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - b. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
 - c. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
7. Fill: Soil materials used to raise existing grades.
8. Rock: Rock material in beds, ledges, un-stratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57

- cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, or ripping:
 - a. Excavation of Footings, Trenches, and Pits: Track-mounted hydraulic excavator; equipped with a 42-inch- (1065mm) wide, short-tip-radius rock bucket; rated at not less than 120-hp (89-kW) flywheel power with bucket-curling force of not less than 25,000 lbf (111 kN) and stick-crowd force of not less than 18,700 lbf (83 kN); measured according to SAE J-1179.
 - b. Bulk Excavation: Track-mounted loader; rated at not less than 210-hp (157-kW) flywheel power and developing a minimum of 45,000-lbf (200-kN) breakout force; measured according to SAE J-732.
 - c. Explosives: The use of explosives is NOT permitted.
- 9. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- 10. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub base, drainage fill, or topsoil materials.
- 11. Utilities include on-site underground and above ground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- 12. Grubbing: The removal of roots, shrubs, and other vegetation to a depth below the ground surface.
- 13. Stabilize: Placement of seed or crushed rock in order to prevent the erosion of soil.

Project Conditions

- 1. Lines and grades shall be as indicated on attached drawings. Contractor shall be responsible for locating or establishing benchmarks and property monuments as indicated. Contractor shall use these benchmarks and reference points and any other points that Contractor may need to establish in order to layout and construct the work properly.
- 2. Carefully maintain all bench marks and monuments and replace as directed if disturbed or destroyed at no additional cost to Owner.
- 3. Disposition of Existing Facilities, Structures and Property:
 - a. Adequately protect from damage all existing utilities, structures and property and remove or relocate only as indicated, specified or as directed by Owner.
 - b. It shall be the Contractor's responsibility to have existing underground utilities located and verified prior to construction activities.
 - c. Report inactive and abandoned utilities encountered in excavating operations. Remove, plug, or cap as directed by Owner.
 - d. Utilities to be Removed: Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- 4. Tree Removal: Coordinate with Site Inspector before any trees are removed.
- 5. Protection of Trees: Protect tops, trunks, and roots of existing trees on project site and borrow sites which are to remain, as follows:
 - a. Box, fence around, or otherwise protect trees before any construction work is started.
 - b. Do not permit heavy equipment or stockpiles within branch spread.
 - c. Trim or prune to obtain working space in lieu of complete removal when possible. Conduct operation as follows:
 - i. With experienced personnel.
 - ii. Conform to good horticultural practice.
 - iii. Preserve natural shape and character.
 - iv. Protect cuts with approved tree paint.

- d. Grade around trees as follows:
 - i. Trenching: Where trenching is required around trees that are to remain avoid cutting the tree roots by careful hand tunneling under or around the roots. Avoid injury to or prolonged exposure of roots.
 - e. Remove when damage occurs and survival is doubtful.
 - f. Replace with similar item when damaged through carelessness and so requested.
- 6. Environmental Protection:
 - a. Contractor shall employ construction methods and techniques that will result in the least detrimental impact upon the environment. Actions taken by the Contractor shall include, but are not limited to the following:
 - i. Contractor shall repair ruts before leaving the area. At the conclusion of each working day the site shall be left in a condition to prevent soil erosion due to a possible rainfall event.
 - ii. Areas that are damaged by construction activities shall be re-graded to their original condition and resurfaced as specified or as directed at no extra cost to Owner. Seeded or sodded areas shall be reestablished with grass as specified.
 - iii. Care should be taken to avoid oil or fuel spills and other pollution. Areas polluted shall be cleaned and restored to their original condition at no extra cost to Owner.
 - iv. If items or areas of possible archaeological interest are uncovered during construction, Contractor shall notify Owner immediately.
 - v. Contractor shall comply with all requirements of all permits issued for this Project.
 - vi. Contractor shall be responsible for all operational aspects of storm water controls, including but not limited to, initial installations, inspections, and maintenance.
- 7. Geotechnical Report will be provided as an addendum once it has been completed and reviewed. Contractor is expected to comply with all the findings of this report. Engineering drawings and scope requirements will be reviewed and amended as necessary. If there are any expected conflicts due to the report findings, Contractor shall address these issues in the submitted proposal.

MATERIALS

Soil

1. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
2. Unsatisfactory Soil: ASTM D 2487 soil classification groups ML, MH, CH, OL, OH, and PT, or a combination of these group symbols.
 - i. Unsatisfactory Soil also includes Satisfactory Soil not maintained within 2 percent of optimum moisture content at time of compaction.
3. Backfill and Fill: Satisfactory Soil materials.
4. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
5. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (38-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
6. Engineered Fill: Satisfactory Soil materials
7. Bedding: Washed, narrowly graded mixture of crushed stone, or crushed or un-crushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

8. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or un-crushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
9. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
10. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
11. Structural Fill: Satisfactory Soil materials

Accessories

1. Drainage Fabric: Non woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - i. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
 - ii. Tear Strength: 40 lbf (178 N); ASTM D 4533.
 - iii. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
 - iv. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
 - v. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.
2. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - i. Grab Tensile Strength: 200 lbf (890 N); ASTM D 4632.
 - ii. Tear Strength: 75 lbf (333 N); ASTM D 4533.
 - iii. Puncture Resistance: 90 lbf (400 N); ASTM D 4833.
 - iv. Water Flow Rate: 4 gpm per sq. ft. (2.7 L/s per sq. m); ASTM D 4491.
 - v. Apparent Opening Size: No. 30 (0.6 mm); ASTM D 4751.

Soil Sterilant

1. Sterilant shall be Hyvar as manufactured by E.I. duPont or a comparable product meeting requirements of State Environmental Protection Laws.
2. Application:
 - i. Subgrade must be approved by Owner prior to placing soil sterilant.
 - ii. Apply to all areas of the substation indicated to receive crushed rock surfacing and crushed rock base course.
 - iii. Apply prior to placing crushed rock.
 - iv. Apply according to manufacturer's recommendations.

Rip-Rap Material

1. Material shall meet the requirements of machined rip-rap (Class 1) given in INDOT Standard Specifications.
2. Stone shall be durable and of suitable quality to ensure permanence of the structure.
3. Quantity of rock with an elongation greater than 3:1 shall not exceed 20 percent of the mass. No stone shall have an elongation greater than 4:1.
4. Material shall be free from cracks, seams, or other defects that would tend to increase its deterioration and shall not have a loss of more than 12 percent after 5 cycles when tested for soundness with sodium sulfate as described in AASHTO T104.
5. Objectionable quantities of dirt, sand, clay and rock fines will not be permitted.

6. Place on the prepared base as indicated in such a manner as to produce a reasonably well graded mass of rock with a minimum practicable percentage of voids.
7. Place to its full course thickness in one operation and in a manner to avoid displacing the base material.
8. Finished rip-rap shall be free from objectionable pockets of small stones and clusters of larger stones. Hand place only if necessary to secure the desired results.
9. A tolerance of plus or minus 4 inches from the slope lines and grades will be allowed to the extremes that such a tolerance shall not be continuous over an area greater than 200 square feet.
10. Maintain the rip-rap protection until accepted and replace any material displaced at no additional cost to the Owner.

INSTALLATION

Preparation

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
2. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
3. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Follow requirements of the contractor-prepared SWPPP and state and local guidelines.

Clearing and Grubbing

1. Clear and grub all areas where earthwork is to be performed and any other areas beyond the earthwork limits where indicated.
2. Clearing:
 - i. Clearing includes felling and disposal of trees, brush, and all other vegetation found on or above the existing ground surface inside the clearing limits.
 - ii. Conduct work in a manner to prevent damage to property and to provide for the safety of employees and others.
 - iii. Keep operations within construction limits indicated.
3. Grubbing:
 - i. Grubbing includes the removal and disposal of all tree stumps and roots where backfill is to be placed and when the excavated material is to be used as backfill. Removal and disposal of tree stumps and roots larger than 3 inches in diameter will be required at all other locations.
 - ii. Backfill all excavated depressions with approved material and grade to drain.
4. Disposal of Debris:
 - i. Dispose of debris from clearing and grubbing at a location off the Job Site, as arranged for by Contractor, at no additional cost to Owner.
 - ii. Contractor may claim and salvage any timber or other debris that must be removed from the Job Site but shall not delay in any manner either this contract or other work with salvaging operations.

Dewatering

1. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
2. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - i. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - ii. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

Excavation, General

1. Unclassified Excavation is the excavation of rock, soil or any combination thereof to the indicated elevation.
 - i. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
 - ii. Rock excavation includes removal and disposal of rock.
2. All excavation for this Project shall be considered Unclassified Excavation. The Contractor shall neither request nor require additional fees from Owner for excavation of rock or other materials.

Approval of Subgrade

1. Notify Engineer when excavations have reached required subgrade.
2. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
3. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.
4. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

Unauthorized Excavation

1. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Engineer.
 - i. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

Storage of Soil Materials

1. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - i. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - ii. Stockpiles shall be located outside of wetland boundaries and managed such that run-off does not impact the wetlands.

Backfill

1. Place and compact backfill in excavations promptly, but not before completing the following:
 - i. All excavation for structure or foundation shall be inspected by geotechnical testing personnel.
 - ii. Construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - iii. Surveying locations of underground utilities for record documents.
 - iv. Inspecting and testing underground utilities.
 - v. Removing concrete formwork.
 - vi. Removing trash and debris.
 - vii. Removing temporary shoring and bracing, and sheeting.
 - viii. Installing permanent or temporary horizontal bracing on horizontally supported walls.

Moisture Control

1. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within +3 to -2 percent of optimum moisture content.
 - i. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - ii. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

Compaction of Backfills and Fills

1. Place backfill and fill materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
2. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
3. Compact soil to not less than the following percentages of maximum dry unit density according to ASTM D 698 (Standard Proctor):
 - i. Under structures, building slabs, steps, pavements, and detention basin berms scarify and re-compact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 98 percent. The upper 24 inches of fill (upper 12 inches in excavations) beneath proposed pavements and structures and pond bottoms shall be compacted to 98 percent maximum dry density.
 - ii. Under walkways, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent.
 - iii. Under lawn or unpaved areas, scarify and re-compact top 6 inches (150 mm) below subgrade and each layer of fill material at 90 percent.

Grading

1. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - i. Provide a smooth transition between adjacent existing grades and new grades.

- ii. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
2. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - i. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).

Field Quality Control

1. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality control testing.
2. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
3. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.
4. Testing agency will test compaction of soils in place according to ASTM D 1556. Tests will be performed at the following locations and frequencies:
 - i. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
 - ii. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet (30 m) or less of wall length, but no fewer than two tests.
 - iii. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.
5. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and re-test until specified compaction is obtained.

Protection

1. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
2. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - i. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.
3. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - ii. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

Disposal of Surplus and Waste Materials

1. Satisfactory Soil: Transport surplus satisfactory soil to designated storage areas at Job Site. Stockpile or spread soil as directed by Engineer.
2. Remove waste material, trash, and debris, and legally dispose of it off Owner's property, following any and all laws and regulations. If any spoils have unusual staining or odors, inform Owner immediately. Unsatisfactory soil should remain on site and used in other locations.

Maintenance and Repair

1. Maintenance:
 - i. Settling or erosion shall be filled, repaired and grades reestablished to elevations and slopes indicated.
2. Correction of Settlement:
 - i. Contractor is responsible for correcting any excessive settlement as determined by Owner, for the specific areas of backfill and damages created thereby within one year after acceptance of the Work.
 - ii. Make repairs within 10 days from and after due notification by Owner of backfill settlement and resulting damage.
 - iii. Make own arrangements for access to the site for purposes of repair.

**Appendix I to LGIA
Facilities Study Report**



PPL companies

FS-LGE-GIS-2019-002

Facilities Study Report

May 29, 2020

Study & Preliminary Report Completed By:
LG&E/KU Transmission

Report
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1. Executive Summary

A Facilities Study was performed by LG&E/KU for the following request:

**Table 1
Request Details**

Queue Position	Queue Date	County	State	Max Output (MW) S/W	Point of Inter-connection	In-Service Date	Inter-connection Service Type	Generator Type
LGE-GIS-2019-002	02/06/2019	Ballard	KY	104/104*	Grahamville-Wickliffe 161 kV Line	06/01/2023	NRIS/ERIS	Solar

*Customer reduced capacity from 110 to 104 for the facilities study

TranServ as Independent Transmission Organization (ITO) completed a Generator Interconnection (GI) System Impact Study (SIS). The GI SIS analyzed the impact of this Generator Interconnection, located near Paducah, Kentucky, in accordance with the LG&E and KU Large GI Study Criteria document as posted on the LG&E and KU Open Access Same-Time Information System (OASIS). Customer executed a Facility Study Agreement with for the ITO and LG&E and KU to complete a Facilities Study. LG&E and KU Services Company (LG&E-KU) contracted Black & Veatch (BV) to complete a +/-20% cost estimate study for the Generation Interconnect Request GI-2019-002 facility study. The request requires a new interconnection substation that will tap the existing 161 kV Grahamville to Wickliffe line in Ballard County, Kentucky.

The LG&E/KU Open Access Transmission Tariff (OATT) states that the Facilities Study will include a good faith estimate of (i) the cost of Direct Assignment Facilities to be charged to the Eligible Customer, (ii) the Eligible Customer’s appropriate share of the cost of any Network Upgrades, and (iii) the time required to complete such construction and initiate the requested service.

TranServ has reviewed the Facilities Study results from LG&E and KU and prepared this report in accordance with the LG&E and KU OATT.

2. Constraint Identified in the SIS

2.1 Steady State Constraints

In the SIS report, only LG&E and KU 2020 Summer Peak thermal constraints were identified. The LG&E and KU 2020 Summer Peak thermal constraints due to the subject request are shown in Table 2-1.

Table 2-1
LG&E and KU Thermal Constraints

Year / Season	Dispatch	Facility	Rating	Pre Project		Post Project		DF
				MVA	%	MVA	%	
All Summer Scenarios	All	Wickliffe 161/69 kV Tx	107	1	1%	113	105	99%

The above constraint was reevaluated in this facilities study. With reduction of LGE-GIS-2019-002 capacity from 110 MW to 104 MW, no overload is found in this facility study and no mitigation is required for the Wickliffe 161/69 kV transformer overload found in SIS.

2.2 Flowgate Analysis Results

No flowgate constraints due to the subject request were found in the SIS report.

2.3 Contingent Facility Analysis Results

There are no planned transmission improvements associated with any earlier queued LG&E and KU GI request. Thus, no study to determine whether or not those facilities would be contingent facilities for this request was performed.

2.4 Short Circuit Analysis Results

The Short Circuit Analysis results from the SIS indicate that the transmission system has adequate interrupting capabilities to accommodate the addition of the new solar generator

2.5 Stability Analysis Results from SIS

The Stability Analysis Results from the SIS were reviewed along with the stability issues found for the 3-breaker interconnection option in the SIS as part of this facilities study. The 3 breaker configuration was re-evaluated with the latest PSS/E version (33.12.1) that includes a more accurate and improved GI-2019-002 inverter model. Therefore, stability study results from SIS are replaced with facilities stability study results (provided in section 2.6).The stability analysis

was performed for both near term and out year summer peak, summer generation maximization, and light load system conditions with appropriate earlier queued generators included in the model.

2.6 Stability Study Analysis from the Facilities study

TO performed stability simulations considering 3 breaker interconnection option with the latest PSS/E version (33.12.1) and results are provided in this section. The ITO reviewed these results and agree with these results and conclusion.

2.6.1 Results

Criteria violations were identified with the original customer provided under frequency protection settings. The SIS report provides updated under frequency protection option 2 settings and these were implemented in the FS.

Table 2-2-A
Option 2: Modify Relay Pickup Time Settings (From SIS)

	Freq range	Relay Pick up time (sec)	Breaker Delay Time (sec)
ITO recommended settings	FRQTPAT-Instance 13 : 40-65 Hz	0.2	0.01
	FRQTPAT-Instance 18 : 57-80 Hz	0.2	0.01
	FRQTPAT-Instance 19 : 55-80 Hz	0.2	0.01

The initial results indicated that the GI-2019-002 solar generation would trip due to under-voltage with the customer provided voltage relay settings. It was determined that the customer provided relay settings were more stringent than the recovery criteria outlined in the TO performance documentation. The customers relay settings were adjusted as shown below to account for this issue and ensure that PRC-024 criteria is maintained. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

Table 2-2-B
Modify Relay Pickup Time and Voltage Range

MINS	Protection module	Machine Bus Number		ID	Lower Bandwidth	High Bandwidth	Relay pick up Time	Breaker Delay Time
6	VTGTPAT-Used in the SIS	991044	991044	1	0.89	1.8	3	0.01
6	VTGTPAT-Modified for the Facility Study	991044	991044	1	0.8	1.8	4	0.01

Also, criteria violations were identified in the SIS with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

2.6.1.1 Disturbance Evaluation P2-P7

The ITO studied and confirmed the lack of issues with both P1 and P6 contingencies as outlined in the SIS report. Therefore, the analysis consisted of P2-P7 analysis. All monitored voltages and angles as outlined in the SIS study were found to be within acceptable limits with the addition of the 104.0 MW solar generation at the point of interconnection. It was determined that there were no criteria violations for the disturbances evaluated in this analysis.

2.6.1.2 Impedance swing

To address Sections 4.1.2 and 4.3.1.3 of the TPL-001-4 standard, stability analysis was performed to assess tripping due to transient swings. The goal of the apparent impedance swing test is to determine if there are any breaker mis-operations as a result of an apparent impedance swing during the stability simulation. The breakers need to be able to clear the fault during normal or delayed clearing events. However, non-faulted facilities need to remain in service. Distance relays, which are designed to determine if a fault is on the system, could mis-operate due to an apparent impedance swing resulting in tripping of facilities that are not needed in order to clear the fault. These distance relay settings are defined in the SIS report. It was determined that there were no misoperations for the disturbances evaluated in this analysis.

2.6.2 Conclusion

Criteria violations were identified with the original customer provided under voltage and under frequency protection settings. Updated settings are provided in the SIS and FS to alleviate these issues. The customer must verify with the manufacturer any technical limitation or generator protection issues and work with the TO and ITO to determine mutually agreeable relay settings.

With the newly updated protections settings, criteria violations were identified with reclosing enabled on the Grahamville to GI-2019-002 POI 161 kV line and Wickliffe to GI-2019-002 POI 161kV line. Reclosing must be disabled or extended to 61 cycles on the Grahamville to GI-2019-

002 POI 161 kV line and the Wickliffe to GI-2019-002 POI 161kV line prior to the GI-2019-002 interconnection.

The two breaker interconnection option was not considered in this study since a 3 breaker interconnection option (figure 1) shows no need for any additional mitigations other than the study recommended relay settings and it is a more reliable standard interconnection for the LGE and KU system.

When using the ITO and TO recommendations from the SIS and FS. All study disturbance (disturbances as outlined in the SIS study) results were found to be within criteria with the addition of the 104.0 MW solar generation at the point of interconnection.

2.7 Stiffness Verification due to Inverter Based Resource Interconnection

The GIS-2019-002 Short circuit ratio (SCR) was found to exceed the minimum requirement of 2.0. Due to the location of the GIS-2019-002 POI, the Weighted SCR (WSCR) did not apply. There are no Grid Stiffness constraints to granting the GIS2019-002 GI request.

3. Affected System Impacts from SIS

Tables 3-1 and 3-2 from the SIS report documented the Ad Hoc Study Group Comments which relate to independent testing performed by the Ad Hoc Study Group members consistent with the allowance for such testing in the LG&E and KU TSR Criteria document.

Table 3-1
Ad Hoc Study Group Independent Study Comments

Ad Hoc Group Member	Date Received	Ad Hoc Group Member Comment provided within the October 31, 2019 Deadline
No Ad Hoc Member provided independent testing results which identified the need for an Affected System Study for this request		

4. Facilities Study Results from LG&E and KU

4.1 Methodology

The following terms are defined in this facilities study report

1. **New Network Facilities (NNF)** - additions, modifications, and upgrades to the Transmission Owner's system required at or beyond the Point of Interconnection (POI) to accommodate the interconnection of the Generating Facility to the Transmission System. It is possible for system network power to flow through NNF equipment, along with generation facility power.
2. **Transmission Interconnection Facilities (TIF)** - all facilities and equipment owned by the Transmission Owner from the Point of Interconnection (POI) to the Point of Change of Ownership (PCO); including any modifications, additions, or upgrades to such facilities and equipment. Transmission Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Generator Upgrades, Stand Alone Network Upgrades, or Network Upgrades. Only generation facility power can flow through TIF equipment.
3. **Generation Owner Facilities** – all facilities and equipment owned by the Interconnection Customer starting at the Point of Change of Ownership (PCO).
4. **Point of Interconnection (POI)** – the point where the transmission interconnection facilities connect to the new network upgrades.
5. **Point of Change of Ownership (PCO)** – the point where the Interconnection Customer's facilities connect to the transmission interconnection facilities.

6. Distribution Upgrades (Distribution Facilities)

Article 11 of the LGIA specifies which party (Transmission or Generator Owner) has a construction obligation and who bears the expense of that obligation. Based on the requirements within the LGIA:

- **Generator Owner Facilities:** The Generator Owner is responsible for building, owning, and maintaining the assets. The Generator Owner bears the expense for these assets.
- **Transmission Interconnection Facilities (TIF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. The Generator Owner bears the non-refundable expense for these assets (Generation contribution to Transmission).
- **Network Facilities (NF) (include NNF):** LG&E and KU Transmission is responsible for building, owning, and maintaining the assets. However, the Generator Owner funds the initial expense for the Network Facilities unless LG&E and KU Transmission chooses to fund them. Any funds received from the Generator will be refunded to the Generator,

plus interest, as the Generator takes transmission service, or repayment can be set up over a defined period. The Terms of payment for the Network Facilities will be determined in the negotiation period (identified in the LG&E and KU OATT: Attachment M Section 11) of the LGIA.

- **Distribution Facilities:** LG&E and KU Transmission does not own any Distribution Assets. So, Distribution Asset Costs identified would be reviewed and determined with the local distribution utility.

7. **Interconnection Customer (IC) - The Generator Owner.**

The LGE-GIS-2019-002 Solar Transmission Estimate was created following the below steps:

- a. Engineering and Project Management costs were estimated. LG&E and KU project Management & Engineering labor were estimated at 20% of the contracted project Management & Engineering labor cost.
- b. Construction Management labor costs were estimated. LG&E and KU Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- c. The Generator Owner faculties are not included in the estimates.
- d. The Transmission Owner's Telecommunications Department provided an estimate for telecom facilities.
- e. Cost estimates were broken down between Company labor, contracted labor, materials, and contingency.
- f. Pricing provided by the vendor was combined with Transmission Owner's burdens and contingency cost
- g. Pricing provided by the Transmission Owner's Telecommunications Department was aggregated in the cost summary table.
- h. The responsibility for costs was determined per the Transmission Owner's *Allocation of Costs for Generator Interconnections* document, effective January 1, 2018, for a new three breaker ring bus configuration. As such, all costs associated with this estimate are categorized as Transmission Interconnect Facilities (TIF). To remain consistent with past Facility Study reports, and to emphasize that all costs will be the sole responsibility of the Interconnection Customer, the cost estimate in Table 4-1: Estimated Costs of Facilities and Section 4.5.2 Cost Estimate Summary includes Transmission Interconnect Facilities (TIF). New Network Facilities will total to \$9,801,317 USD for this scope.

4.2 Major Project Assumptions, Constraints, and Risks

4.2.1 Assumptions and Clarifications

The cost estimates prepared for this interconnect request are based on the following assumptions.

- The IC's interconnection circuit construction and the IC's generation facilities are not included in this study.
- Estimate accuracy is +/- 20%.
- Internal LG&E-KU costs for Project Management & Engineering labor were estimated at 20% of the contracted Project Management & Engineering labor costs.
- Internal LG&E-KU costs for Construction Management were estimated at 50% of the contracted Construction Management labor costs.
- Telecom labor and material costs were provided by LG&E-KU and are assumed to be 100% LG&E-KU costs.
- LG&E-KU burdens and contingency were estimated internally by LG&E-KU.
- All contracted costs presented within this report include 6% escalation on cost, contractor burdens, and markups.
- Union Labor rates were utilized for construction labor.
- Materials are assumed to be tax exempt. No sales taxes are included in the estimate.
- Insurance is included for contracted costs.
- Engineering, Project and Construction Management, and Construction Mobilization/Demobilization costs were allocated between Network Facility (90%) and Transmission Interconnection Facility (10%) costs.

4.2.1.1 Construction

- Temporary construction power is assumed to be provided by LG&E-KU.
- Adequate site access will be provided by the IC.
- Costs for subcontracted site security are included for non-work hours, holidays, and weekends for the duration of construction.
- Costs are included for a part-time onsite Construction Safety manger.
- Temporary laydown, matting, or other improvements are not included.

4.2.1.2 Civil-Site Development

- Site development for the access road, substation pad, and transmission cut-in will be by the IC and is not included in the cost of this estimate. It is assumed that all property purchase, site clearing/grubbing, grading, landscaping, drainage, storm water, and/or erosion control design, permitting, and construction will be provided by the IC. The IC will provide a rough graded and fenced pad with a 20' swing gate per LG&E-KU standards.
- Boundary, topographic, and/or environmental surveys are not included and are assumed to be by the IC.
- Site Planning, Zoning, Easement and/or Real Estate negotiations or approvals are not included and are assumed to be by the IC.
- All environmental and other necessary permits to complete the site development construction will be secured and paid for by the IC.

4.2.1.3 Civil-Structural

- H-frame and lightning mast structures will be comprised of bent plate and will be detail- designed by a steel fabricator, with loads provided by the substation engineer.
- All remaining steel will consist of standard AISC shapes to be detail-designed by the substation engineer.
- Geotechnical soil information was not available at the time of the estimate completion. Black & Veatch completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate.
- Based on the proposed location of the site, it is expected that the site will fall under Seismic Design Category D. Liquefaction was not considered for foundation design estimates.
- The soil conditions are assumed to be conducive for the installation of drilled pier foundations, but will require additional detailing to meet the building code requirements for Seismic Design Category D. Tie spacing is assumed to be 4" on center.
 - The H-frame and H-frame with switch foundations are assumed to be 5' diameter piers extending 22' and 25', respectively.
 - The lightning mast foundations are assumed to be 4' diameter piers extending 18'.

- All substation structures are supported on 3' diameter, 9' long piers, with the exception of the high bus and high disconnect switch structures, which are supported on 12' long piers.
- The control house is supported by (10) 2.5' diameter, 15' long drilled piers.
- The control house is assumed to be constructed at approximately grade elevation. It will not be elevated for flood considerations. No stairs are assumed to be required.

4.2.1.4 Relaying & Communications

- The IC will supply the fiber communication (OPGW) channel between the IC collector substation and the LG&E-KU station.
- The estimate includes costs for the fiber connection from the new LG&E-KU Control House to the H-Frame dead end structure.
- The IC will supply a line protection relay panel in the IC-owned collector substation to interface with the LG&E-KU-owned line protection relay panel in the interconnection station for coordinated protection of the IC line segment.
- LG&E-KU Telecom will design and construct a 195' tall microwave tower to be installed inside the LG&E-KU substation. Physical space has been allocated for the tower in the conceptual substation arrangement.

4.2.2 Project Risks and Constraints

- Geotechnical soil information was not available at the time of the estimate completion. The vendor completed a geotechnical desktop review of the site location to generate foundation design assumptions for the estimate. The site is anticipated to have clay soil over shallow limestone rock and require site grading to balance the station pad elevation. Costs for procurement of soil borings and completion of a geotechnical report are included in the estimate. Site soil conditions that differ from anticipated conditions could have significant impact on foundation design and below grade construction.
- No property survey information was available at the time of the conceptual substation design and cost estimate. The location of the network and interconnection facilities were identified based on aerial imagery and partial property parcel information. Changes to the physical location of the facilities could impact costs.

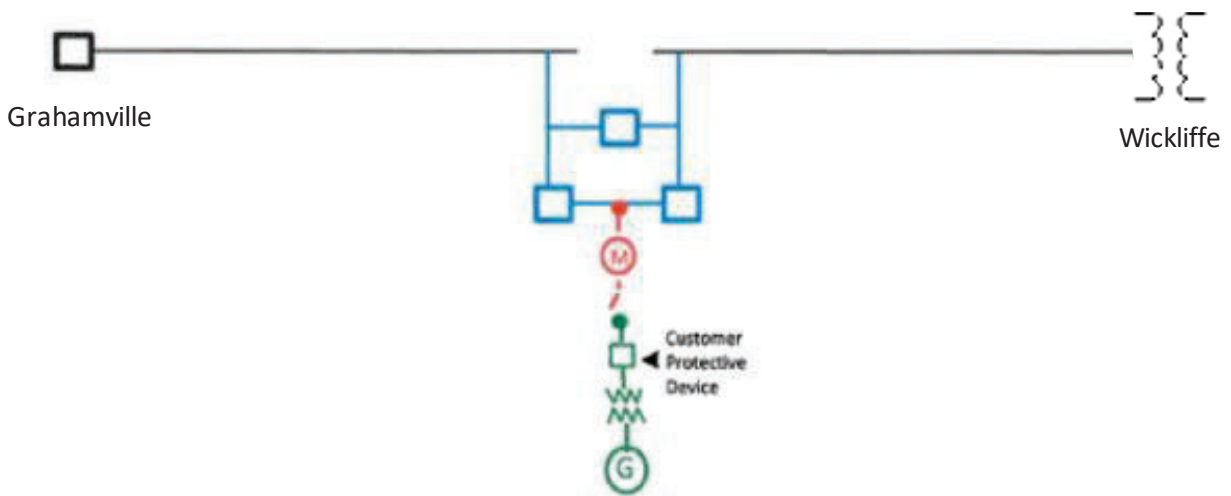
- Material and labor availability at the time of project execution could have significant cost impacts.

4.3 Interconnection Facilities Needs

Figure 1 shows the division of responsibility for a new three breaker ring bus configuration, per the Transmission Owner's Allocation of Costs for Generator Interconnections document, effective January 1, 2018.

The new interconnection facility will be constructed adjacent the IC's collector substation. The IC will be responsible for the design, construction, and permitting of the 161kV transmission line from their facilities to the Point of Change of Ownership (PCO) at the LGE-GIS-2019-002.

Figure 1: Point of Interconnection



Legend:

- Black = Existing Transmission Facilities
- Blue = New Network Facilities
- Red = Transmission Interconnection Facilities
- (M) = Interconnection Metering and Associated Equipment
- Green = Generation Facilities
- = Point of Interconnection
- = Point of Change of Ownership

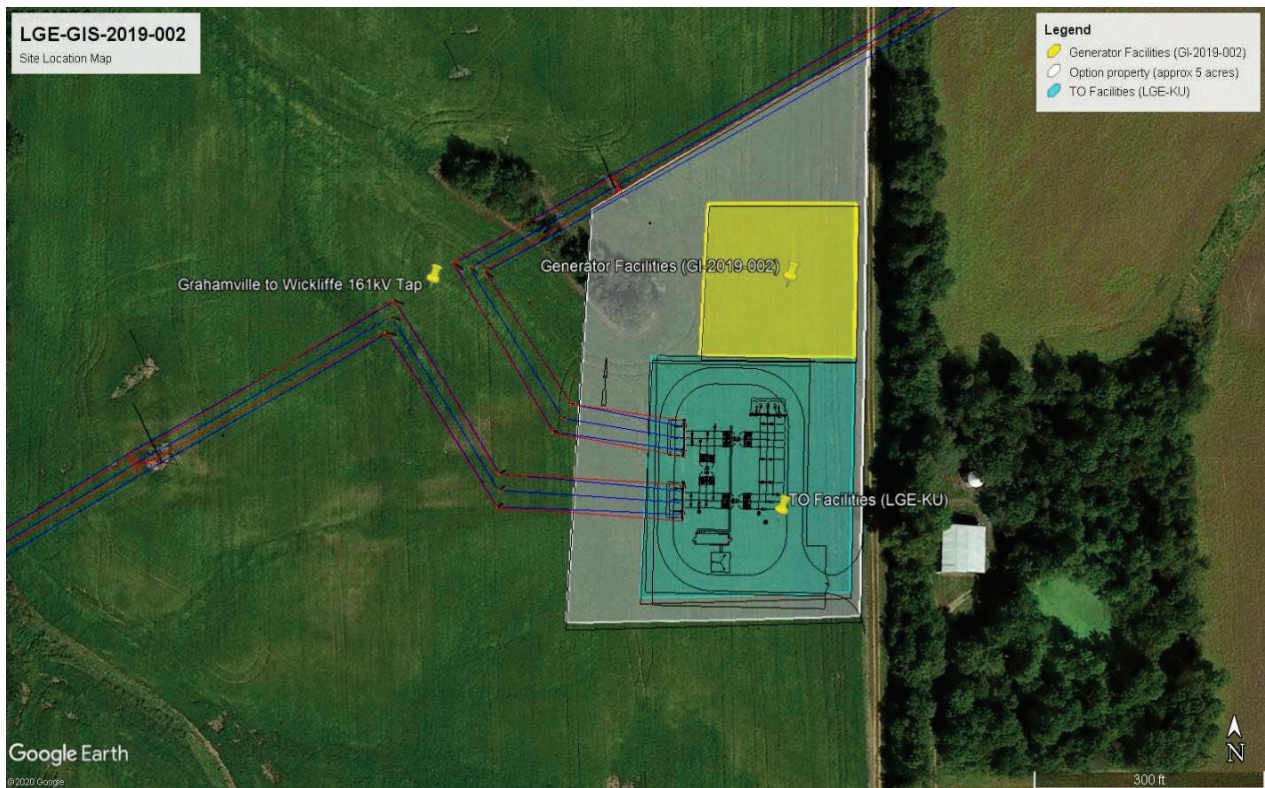
Details of the Transmission Interconnection Facilities and New Network Facilities required for the generation interconnection are provided in Section 4.5.

4.4 Description of Upgrades

This section describes facilities identified to be installed, replaced, and/or upgraded by LG&E-KU to accommodate the project. During detailed design other components may be identified for installation or replacement due to this interconnection.

The conceptual station arrangement developed for this estimate is included as Appendix A. The proposed station arrangement and location relative to the transmission corridor and the IC facilities is shown below in Figure 2. The approximate latitude and longitude of the POI is 37° 1'3.21"N, 88°54'50.30"W.

Figure 2. Project Location Map



The locations of the interconnection facilities were selected based on the following criteria:

- The anticipated size of the new 161kV station

- The proximity and orientation of the station to the existing 161kV transmission corridor, and
- The approximate interconnect facility boundary provided by the IC (See Appendix B)

4.5 Total Conceptual Cost Estimate: (Total Estimated Cost \$10,795,163 USD)

The cost estimates are based on a ring bus interconnection configuration as shown in Figure 1 in section 4.3 and the assumptions provided in the section 4.2. The estimated total project cost is estimated with +/- 20% accuracy.

4.5.1 Generator Owner Facilities

The generator owner is responsible for the installation and costs for the generator, step up transformer and customer protective devices up to the Transmission Owner (TO) metering equipment. The customer is responsible for determining the generator owner costs for the facilities owned and operated by the customer.

4.5.2 Transmission Interconnection Facilities: (Total Estimated Cost \$993,846)

The transmission interconnection facilities will include all equipment and materials at the interconnection facility between the Point of Ownership Change and the Point of Interconnection. The required equipment and materials are identified below, and a summary of the interconnection facilities costs are provided in Table 4-1.

4.5.2.1 Station

The transmission interconnection facilities will include the following:

4.5.2.1.1 High Voltage

- One (1) 161kV Motor-Operated Disconnect Switch
- Three (3) 161kV Surge Arresters
- Three (3) 161kV Metering CCVTs
- Three (3) 161kV Metering CTs

4.5.2.1.2 Civil/Structural

- One (1) Steel A-Frame structure
- Six (6) 1-Phase CCVT Supports

4.5.2.1.3 Protection & Control

- One (1) New Control House Space Allocation consisting of below relay panels:
- (1) line protection panel for GI Interconnect
 - (1) metering panel for GI
- (1) RTU panel
- AC/DC systems

4.5.3 Transmission Lines

Not applicable.

4.5.3.1 Telecommunication Facilities

- Not applicable.

Table 4-1
Transmission Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$287,730
Contract Labor	\$47,760
Contracted Materials	\$568,006
Company Materials	\$0
Contingency	\$90,350
Total	\$993,846

4.5.4 Network Facilities: (Total Estimated Cost \$9,801,317 USD)

4.5.4.1 Network Interconnection Facilities: (Total Estimated Cost \$9,801,317)

LG&E/KU and the vendor combined cost estimate for network interconnection facilities is shown in Table 4-2 and includes the following:

4.5.4.1.1 Station

- The new network interconnection facility will be a three (3) breaker ring bus arrangement with three (3) 161kV lines (Grahamville, Wickliffe, & GI Interconnect) and the following equipment:

4.5.4.1.2 High Voltage

- Three (3) 161kV Circuit Breakers
- Six (6) 161kV Manually Operated Disconnect Switches
- Six (6) 161kV Surge Arresters
- Six (6) 161kV CCVTs
- Two (2) 161kV SSVTs

4.5.4.1.3 Civil/Structural

- Two (2) Steel H-Frame structures
- Five (5) 3-Phase High Bus Supports
- Twelve (12) 1-Phase Low Bus Supports
- Six (6) Switch Support Stands
- Six (6) 1-Phase CCVT Supports
- Two (2) SSVT Supports
- One (1) Lightning Mast

4.5.4.1.4 Protection & Control

- One (1) Small (14' x 42') control house consisting of the following relay panels:
 - (2) line protection panels for Grahamville & Wickliffe & GI Interconnect
 - (2) Digital communications paths, (1) associated with the Grahamville line and (1) associated with the Wickliffe line
 - (1) RTU panel
 - (1) DFR panel
 - AC/DC systems
- One (1) line protection replacement panel at Wickliffe

4.5.4.2 Transmission Lines

- Four (4) 161kV three (3) pole steel dead end structures and foundations
- Hardware and Conductor for taps from existing 161kV line to the station structure

4.5.4.3 Telecommunication Facilities

- One (1) 195' tall Microwave tower and foundations
- Antennae systems
- MW Radio HS Terminal
- Digital Multiplex Systems and Channels
- DC Power

Table 4-2
Network Interconnection Facility Cost Estimate

Description	Cost
Company Labor	\$3,995,967
Contract Labor	\$937,195
Contracted Materials	\$3,195,551
Company Materials	\$781,575
Contingency	\$891,029
Total	\$9,801,317

4.5.5 Distribution Facilities: (Total Estimated Cost \$0 USD)

No distribution facility upgrades have been identified.

5. Conclusion and Project Completion Timeframes

The planned in-service date requested by the Interconnection Customer is June 1, 2023. The Conceptual Milestone Schedule (Table 5-1) to meet the requested in-service date.

Table 5-1 Conceptual Milestone Schedule

Milestone Activity	Milestone Dates
Project Initiation	June 2021
NTP for Engineering, Procurement and Construction	1-Mar-22
Engineering	1-Mar-22 to 1-Sep-22
Procurement	1-May-22 to 1-Nov-22
Construction Mobilization	1-Sep-22
Testing & Commissioning	1-Jun-23
In-Service Date	1-Jun-23

The overall estimated timeline for this project is approximately 24 months from the date of the interconnect agreement. This includes approximately six (6) to nine (9) months for project initiation and 15 to 18 months for the engineering, procurement, and construction phases. This estimate includes the assumption that the project schedule would not be impacted by storm damage and restoration, time of year limitations, permitting issues, outage scheduling, system emergencies, and contractor and equipment availability, or other unforeseen circumstances.

Customer must work with the TO to provide relay settings as identified in the section 2.6.1 (see Table 2-2-A and 2-2-B in this report). Interconnection to LG&E and KU system is contingent on steady state, short circuit and dynamic model, assumptions and settings used in the SIS and facilities study.

6. References

[1]https://www.oasis.oati.com/woa/docs/LGEE/LGEEdocs/Allocation_of_Costs_for_Generator_Interconnections_effective_1-1-2018.pdf

Appendix A. Conceptual Substation Layout

The appendix A of this report is available on the LG&E and KU Critical Energy Infrastructure Information (CEII) File Transfer Protocol (FTP) site. The LG&E and KU secure CEII FTP site URL is: <https://eftws.lge-ku.com/EFTClient/Account/Login.htm>.

Appendix B. Approximate Property Boundaries

