Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AG1-526

"West Garrard 345 kV"

Revision 0: December 2024

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff. The Transmission Owner (TO) is East Kentucky Power Cooperative ("EKPC").

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a Solar Generating Facility located in Garrard County Kentucky with a designated PJM Project ID of AG1-526. The installed facilities will have a total Maximum Facility Output (MFO) of 222 MW with 133.2 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the EKPC transmission system via a direct connection into the West Garrard 345 kV substation.

The proposed generation interconnection is shown on the single line diagram in Mete #1.

3. POINT OF CHANGE IN OWNERSHIP

The Point in Change of Ownership will be located at the Project Developer (PD) side of a 345 kV disconnect switch to be installed by EKPC at the interface between the PD-owned substation facilities and EKPC's substation facilities at the West Garrard 345 kV Substation. The switch shall be installed on a steel transmission line monopole structure located outside the substation fence. The exact location will be determined during project detail design and EKPC will install, own, operate, and maintain the switch.

4. SCOPE OF PROJECT DEVELOPER INTERCONNECTION FACILITIES

Project Developer will design, build, own, operate and maintain the Project Developer Interconnection Facilities on Project Developer's side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- Main Power Transformer(s) (MPT), Generation step-up (GSU) transformer(s) or final transformation, as applicable.
- Circuit breakers and associated equipment located between the high side of the MPT(s) or GSU(s) and the Point of Change in Ownership
- Generator lead line from the Generating Facility to the Point of Change in Ownership
- Relay and protective equipment, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) to comply with EKPC's Applicable Technical Requirements and Standards

The proposed facility must meet EKPC's published facility connection requirements. The latest version of these requirements can be accessed via the following link:

https://www.pjm.com/planning/design-engineering/to-tech-standards/ekpc.aspx

Reference section 5.9 for inverter-based generating facilities.

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AG1-526 project to the EKPC transmission system. These facilities shall be designed according to EKPC Applicable Technical Requirements and Standards. Once built, EKPC will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

A 345 kV dead-end structure and foundation outside the fence of the Interconnection Substation, to terminate the Project Developer's generator lead line will be considered Transmission Owner Interconnection Facilities (TOIF). A 345 kV 3-pole disconnect switch will also be mounted to this dead-end structure serving as the PCO.

The TOIF will also include line conductor from the dead-end structure to the bus position in the switchyard of the West Garrard substation.

Installation of fiber cable circuits

EKPC shall use telecommunications equipment that matches its current network and equipment requirements.

Two 48-strand fiber optic cables will be installed between the EKPC substation control house at the West Garrard substation and the PD facility for relaying, metering, and SCADA circuit requirements. The exact details and installation plans for this fiber will be developed during project scoping.

2. STAND ALONE NETWORK UPGRADES

No stand-alone network upgrade scope has been identified for the AG1-526 project.

3. NETWORK UPGRADES

Expanding existing EKPC substation:

West Garrard 345 kV Upgrade

The existing substation, West Garrard 345 kV, will be expanded/upgraded to interconnect the project with the EKPC transmission system.

Scope of Work

The major equipment and material associated with the West Garrard 345 kV substation upgrade is listed below:

QTY	Unit	DESCRIPTION
1	Each	345 kV, 2000 Amp Circuit Breakers
2	Each	345 kV GOAB Switches (includes PCO Switch)
1	Lot	Electrical Material (insulators, terminals, etc.)
3	Each	Arresters, Lightning 276 kV Station 220 MCOV Polymer
3	Each	Metering CT's,345 kV
3	Each	Line CCVT's,345 kV

The PD shall be responsible for acquiring all property required for the upgrade/expansion of the West Garrard 345 kV substation, if required, and shall deed that property to EKPC. EKPC will have no responsibility to acquire any property associated with the substation, either initially or if it is determined later that additional property is required.

System Protection

The following system protection scope of work applies for this project. All system protection equipment described in this section will be owned, operated, and maintained by EKPC.

Relay Panels: Panel for protection of the Project Developer (PD) facility connection– EKPC shall install a standard line panel with P1 & P2 SEL-411L relays. Line option relays shall utilize line current differential.

EKPC requires the PD to utilize all Schweitzer Engineering Laboratories (SEL) relays and related protective equipment for facilities that will be interconnecting or communicating with EKPC relaying. EKPC reserves the right to specify relays or other protective equipment utilized in the IC substation as required based on the protection schemes utilized. All protection system designs shall be reviewed by EKPC System Protection or its designer during the design phase to ensure proper clearing times, coordination, and compliance with applicable NERC regulations.

Control cables shall be pulled from the new circuit breaker and other required equipment to the control house.

Commissioning: Each relay panel shall be fully commissioned prior to being placed in service. Commissioning shall include AC current and potential circuits, DC functional, relay testing, SCADA alarms, and end-to-end testing where required.

West Garrard 345kV Substation - The bus and line protection relay settings will be reviewed, and the relay files will be updated accordingly.

4. OTHER SCOPE OF WORK

No other scope has been identified for the upgrade of the West Garrard substation.

5. MILESTONE SCHEDULE FOR COMPLETION OF EKPC WORK

Facilities outlined in this report are estimated to take 56 months to construct, from the time the Generation Interconnection Agreement is fully executed. This schedule may be impacted by the

timeline for procurement and installation of long lead items, and the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Detailed Design	1	7
Procurment	2	51
Construction	51	56

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

Substation & System Protection Assumptions:

The following general assumptions have been included for the substation information provided:

1. No delays due to equipment or material delivery, environmental, regulatory, permitting, property/easement acquisitions, extreme weather, or similar events.
2. No significant sub-surface rock encountered during construction, and soil conditions suitable for standard ground-grid and foundation installations.

The following engineering assumptions have been included for the substation information provided:

1. Neither foundation nor structural analyses have been performed. Information provided assumes that no significant foundation or structural issues are present.
2. The schedule assumes no issues related to scheduling outages of existing transmission lines to terminate into the new substation.
3. Material and equipment-related costs are based on current pricing at the time of this study.
4. Environmental permits and reviews will be completed by EKPC and can be completed in a timely manner.
5. Further relay coordination will be studied during detailed design.

Metering Assumptions:

The following assumptions have been included for the metering information provided:

1. No delays due to equipment or material delivery, environmental, regulatory, permitting, real estate, extreme weather, or similar events.
2. Fiber-optic cable and associated equipment installation is completed as scheduled.
3. Material and equipment-related costs are based on current pricing at the time of this study.
4. Once fiber-optic cable installation is complete, the fiber will not be damaged.

Communications Assumptions:

The following assumptions have been included for the telecommunications information provided:

1. No delays due to equipment or material delivery, environmental, regulatory, permitting, real estate, extreme weather, or similar events.
2. Material and equipment-related costs are based on current pricing at the time of this

study.

3. Once fiber-optic cable installation is complete, the fiber will not be damaged.

7. REVENUE METERING REQUIREMENTS

All metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AG1-526 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in EKPC's Facility Connection Requirements Document posted on the PJM website.

The revenue metering will be installed on the EKPC side of the PCO, and will be owned and maintained by EKPC. Metering requirements for this facility include the installation of EKPC's standard revenue quality metering package, including potential transformers and current transformers.

The cost for installation of the metering facilities contained in the new EKPC substation are included in the substation costs provided.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the EKPC Facility Connection Requirements Document posted on PJM website. The PD shall be responsible for acquiring all additional property required for the upgrade/expansion of the existing West Garrard 345 kV substation, if required, and shall deed that property to EKPC. EKPC will have no responsibility to acquire any property associated with the substation, either initially or if it is determined later that additional property is required.

9. ENVIRONMENTAL AND PERMITING

No Environmental assessments are necessary for AG1-526.

C. APPENDICES

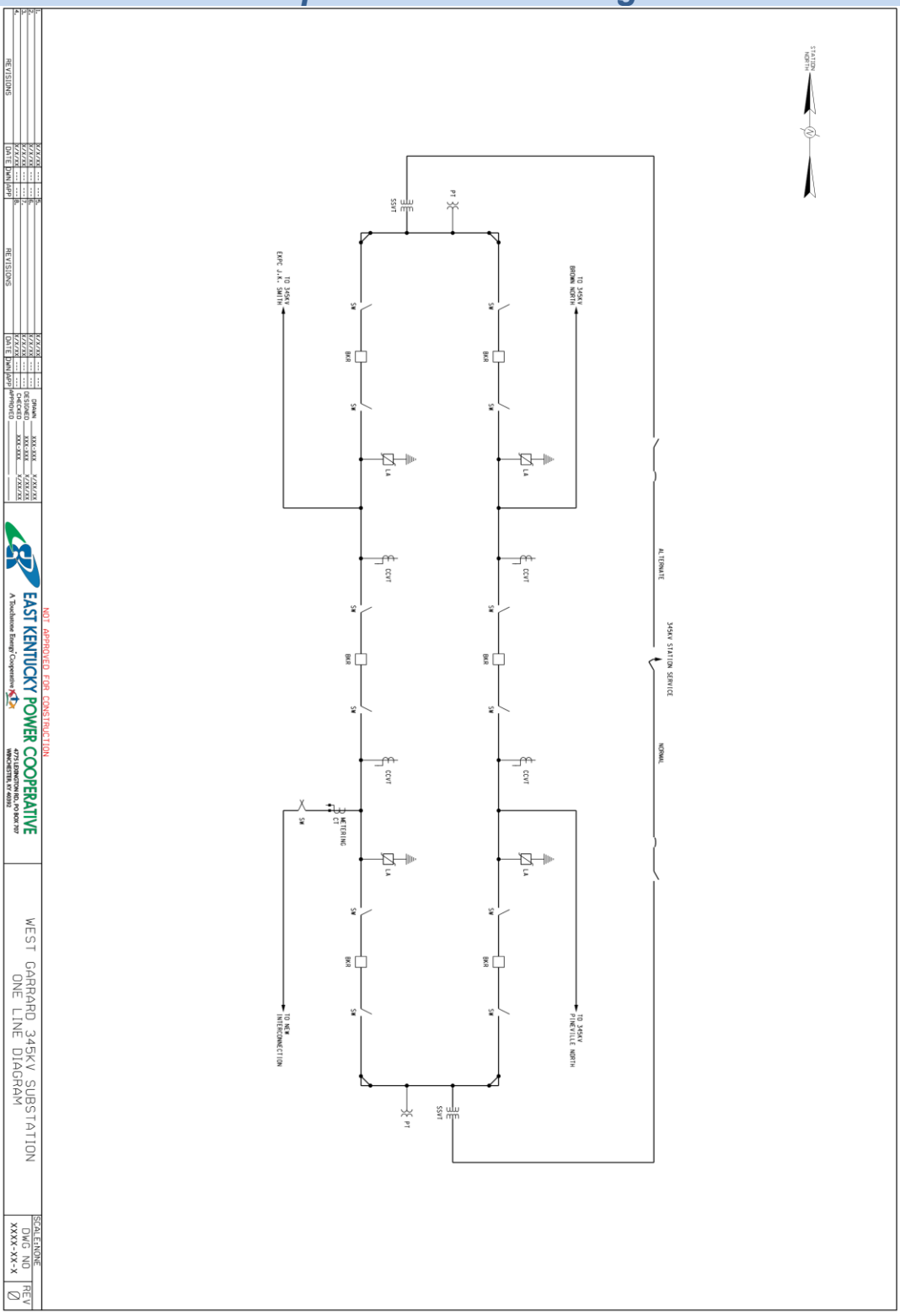
Attachment #1: Conceptual Single line Diagram

Attachment #2: Substation General Arrangement

Attachment #3: Preliminary Site Layout Plan

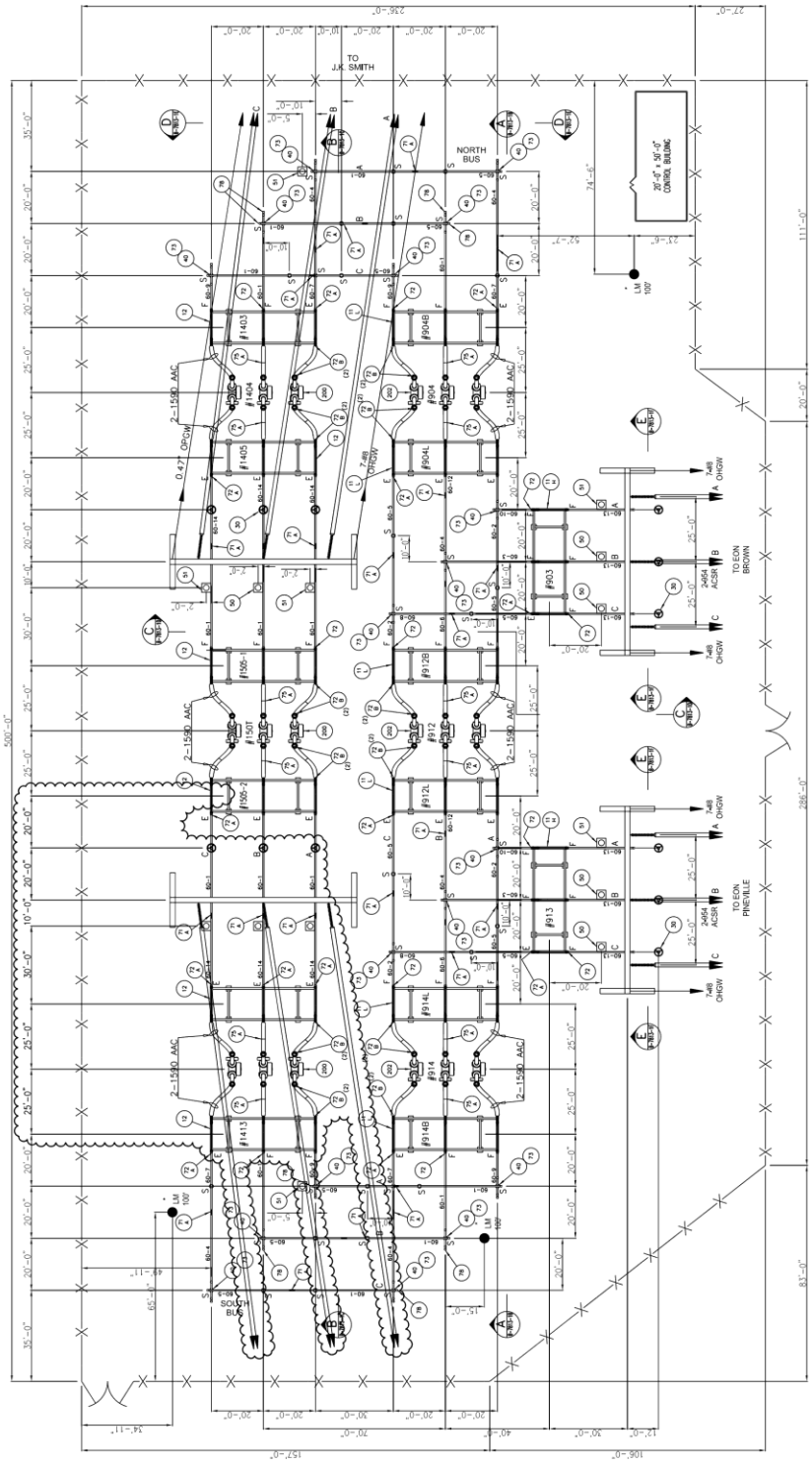
Attachment 1:

Conceptual One Line Diagram



Attachment 2:

Substation General Arrangement



Attachment 3:

Preliminary Site Layout Plan