

Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AH1-721

Laurel Dam – Cooper 161 kV

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff, as well as the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is East Kentucky Power Cooperative (EKPC).

This Facility Study was performed to satisfy the Phase 2 Facility Study requirement of the PJM Tariff. The Facility Study is intended to provide scope, cost and schedule estimates for the project as currently defined and approved for Phase 2 study. In the event project changes are made during DP2 that impact this report, updates will be provided as part of the Phase 3 report. Following execution of the project's final agreement, this report will not be updated to account for other changes made as part of the agreements modification clause and instead the scope change process will be followed.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a Natural Gas Generating Facility located in, Pulaski County, Kentucky with a designated PJM Project ID of AH1-721. The installed facilities will have a total Maximum Facility Output (MFO) of 786 MW with 758.9507 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 newly constructed 161 kV Breaker-and-a-Half (BAAH) substation, East Cooper 161 kV Switching Station, tapping the Laurel Dam – Cooper 161 kV line, approximately 20.8 miles from the Laurel Dam Substation and 0.5 miles from the Cooper Substation.

The construction of the new interconnection substation will split the existing Laurel Dam – Cooper 161 kV line into two lines on the transmission system. The new line will connect East Cooper 161 kV Switching Station to the Cooper Sand Laurel Dam Substations.

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

3. POINT OF CHANGE IN OWNERSHIP

The Point of Change in Ownership will be located at the switches on the three 161 kV dead-end structures within the East Cooper 161 kV Substation fenceline.

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 PCO. This includes, but is not limited to:

- Circuit breakers and associated equipment located between the high side of the Main Power Transformer(s) or Generation Step-Up Transformer(s) and the Point of Change in Ownership.
- Generator lead lines 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 the TO'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>

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AH1-721 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:

Three (3) 161 kV dead-end structures and foundations within the fence of the Interconnection Substation, to terminate the Project Developers generator lead lines will be considered Transmission Owner Interconnection Facilities (TOIF).

The TOIF will also include the line conductors from the dead-end structures to the bus position in the switchyard of the East Cooper 161 kV Switching Station substation.

QTY	Unit	DESCRIPTION
3	Each	161 kV, 2000A, Circuit Breakers
9	Each	161 kV 2000A, Disconnect Switches

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 new East Cooper 161 kV Switching Station 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

East Cooper 161 kV Interconnection Substation

A new 161 kV Breaker-and-a-Half (BAAH) substation, East Cooper 161 kV Switching Station, will be constructed along the Cooper – Laurel Dam 161 kV transmission line to interconnect the project with the EKPC transmission system.

Scope of Work

The major equipment and material associated with the new substation is listed below:

QTY	Unit	DESCRIPTION
4	Each	161 kV A-Frame, Dead-end Structure, Dual-Line Termination
4	Each	161 kV A-Frame, Dead-end Structure, Single-Line Termination
38	Each	161 kV Bus Support Structures

11	Each	161 kV, 2000A, Circuit Breakers
22	Each	161 kV 2000A, Disconnect Switches
1	Lot	Electrical Material (insulators, terminals, etc.)
2	Each	Station Service Transformer, 161 kV, 1 PH
27	Each	Arresters, Lightning 161 kV Station 220 kV MCOV Polymer
29	Each	Line CCVT's, 161 kV, 3 PH

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.

Control House: EKPC shall procure and install a drop-in style control building fully furnished and complete with the relay panels described below, along with auxiliary AC, and two 125V DC battery banks, and all required operating equipment.

Relay Panels: EKPC shall install the following protection and control panels.

East Bus Differential Panel – EKPC shall install a standard bus panel complete with P1 SEL-787Z and P2 SEL-487B relays tripping P1 & P2 bus lock-out relays.

West Bus Differential Panel – EKPC shall install a standard bus panel complete with P1 SEL-787Z and P2 SEL-487B relays tripping P1 & P2 bus lock-out relays.

Line Protection and Breaker Control – EKPC shall install six (6) standard line protection and breaker control panels, each containing two (2) SEL-411L relays for P1 and P2 line protection and one (1) SEL-451 breaker failure relay. The P1 and P2 relays shall utilize a high-speed com-assisted tripping scheme via fiber. Control switches for line reclosing, breaker control and local/supervisory control shall also be provided. These panels will provide line protection for the two (2) lines to the existing Cooper Substation, the two (2) planned lines to the LGE/KU Alcalde Substation, the line to the Laurel Dam Substation, and the line to the Denny Substation.

Tie Breaker Control - EKPC shall install five (5) standard breaker control panels each containing one (1) SEL-451 breaker failure relay and two (2) breaker failure lockout relays. Control switches for breaker control and local/supervisory control shall also be provided.

GSU Breaker Control – EKPC shall install three (3) breaker control panels containing one (1) SEL-451 breaker failure relay. Control switches for breaker control and local/supervisory control shall also be provided.

SCADA Panel – EKPC shall install a standard SCADA panel with Orion LX+ architecture.

DFR Panel – EKPC shall install a fault recording panel with two (2) SEL Axion 2240 I/O modules and one (1) SEL-3555 RTAC unit.

Metering Panel – EKPC shall install a metering panel with dual metering for each GSU at the PD. This includes three (3) ION8650A P1 meters and three (3) SEL-735 P2 meters.

Control cables shall be pulled from new breakers 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, and end-to-end testing where required.

3. NETWORK UPGRADES

Transmission Line Tie-in for new interconnection substation:

The Cooper - Denny 161 kV and the Cooper – Laurel Dam 161 kV lines will be cut and looped into the new interconnection substation. The Cooper-Denny line will be looped into the new East Cooper substation due to its existing route being where the new substation will be constructed.

The new transmission line loop-in facilities will be owned, operated, and maintained by EKPC. The tap from the existing transmission lines into the new substation will consist of two (2) direct embed guyed 3-pole dead-end structures, (2) engineered steel pole dead-ends on drilled shaft foundations, and 3 monopole direct embed tangent structures. . Total installation of new 161 kV line to loop the two existing lines into the new East Cooper substation will be about 0.57 miles.

The existing Cooper – Denny 69kV line will need to be relocated to make room for the new East Cooper substation. This will require (3) direct embed guyed dead-end structures and include 0.54 miles of new 69kV conductor. All existing wires on the Cooper – Denny 69 kV line between the two tie-in structures will be removed.

Upgrades to neighboring facilities:

Cooper Substation

Relay settings associated with the line protection for the Cooper – Denny and Cooper-Laurel Dam 161 kV lines shall be reviewed for the Cooper 161 kV Substation to accommodate the construction of the East Cooper 161 kV Switching Station, and relay files will be updated accordingly. If acceptable relay setting adjustments are not possible due to older model relays, and new modern SEL line relays are required, the cost will be higher. This is to be determined during detailed design.

Denny Substation

Relay settings associated with the line protection for the Cooper – Denny 161kV line shall be reviewed for the Denny 161 kV Substation to accommodate the construction of the East Cooper 161 kV Switching Station, and relay files will be updated accordingly. If acceptable relay setting adjustments are not possible due to older model relays, and new modern SEL line relays are required, the cost will be higher. This is to be determined during detailed design.

Installation of Fiber Circuits:

Not required.

4. OTHER SCOPE OF WORK

No other scope has been identified for the construction of the East Cooper 161 kV Switching Station.

5. MILESTONE SCHEDULE FOR COMPLETION OF EKPC WORK

Facilities outlined in this report are estimated to take approximately 22 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/or, the ability to obtain outages to construct and test the proposed facilities.

Description	Start Month	Finish Month
Detailed Design	1	4
Procurement	2	18

Construction	7	22
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Option to Build Schedule

Option to Build is not applicable for this project since EKPC is also the Project Developer for this generation facility.

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

Transmission Line Assumptions:

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

1. The PD is responsible for either providing deeded property or obtaining any new ROW/easements on behalf of EKPC for routing the looped-in transmission line to the new substation.
2. Any required tree / vegetation clearing for the new substation and the transmission line loop-in work will be the responsibility of the PD.
3. It is assumed that standard drilled piers can be used. If geotechnical assessment reveals poor soil conditions or contamination, additional measures may be required.
4. Required transmission line outages can be scheduled as planned. Transmission line outages are:
 - a. typically, not taken in the summer (June-August) or winter (December-February),
 - b. cancelled during extreme weather conditions, and
 - c. in some cases, required to be scheduled twelve (12) or more months in advance.
5. No delays due to equipment or material delivery, environmental, regulatory, permitting, real estate, extreme weather, or similar events.
6. No significant sub-surface rock is encountered during construction, and soil conditions are suitable for standard foundation installations.

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

1. Neither foundation nor transmission pole structural analyses have been performed. The information provided assumes that no significant foundation or structural issues are present.
2. Construction will be scheduled to avoid winter peak load periods (December - February).
3. The preliminary schedule assumes that transmission line outages can be obtained as necessary.
4. Material and equipment costs are based on current pricing.
5. Environmental permits and reviews shall be completed by EKPC and can be completed in a timely manner.

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 is encountered during construction, and soil conditions are suitable for standard ground-grid and foundation installations.
3. PD shall acquire an adequate and suitable site and grant ownership to EKPC to accommodate

EKPC's interconnection substation, as mentioned above.

4. The PD will provide all necessary easements for a permanent road to provide substation access. This substation access shall be from an existing county or state road. The PD will convey these rights to EKPC if they own the property on which the substation access road will be located.

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.
4. It is assumed OPGW replacement is like for like with existing shield wire on the line. No structure replacements have been assumed and will need to be confirmed during detailed design.

Environmental Assumptions:

The following general assumptions have been included for environmental permitting requirements:

1. Substation location will remain in the currently identified location. Relocation of the substation site may require a re-evaluation of the permitting obligations.

7. REVENUE METERING REQUIREMENTS

All revenue metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AH1-721 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 East Kentucky Power Cooperative 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 property required for this new EKPC interconnection substation and shall deed that property to EKPC. Typically, for a new 161 kV switchyard an approximately 7.5-acre parcel is required. **10. ENVIRONMENTAL AND PERMITTING**

EKPC or its representative will perform all necessary environmental assessments and obtain all necessary permits/approvals associated with construction of all EKPC facilities required to facilitate the interconnection of the new generating facility. This includes the Storm-water Pollution Prevention Plan ("SWPPP"), obtaining KYR 10 storm-water permit, and conducting the necessary SWPPP inspections prior to all construction activities.

9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

Applicable Technical Requirements and the EKPC Technical Standard: Facility Connection Requirements Rev 16 dated 8/15/2025 shall apply.

C. APPENDICES

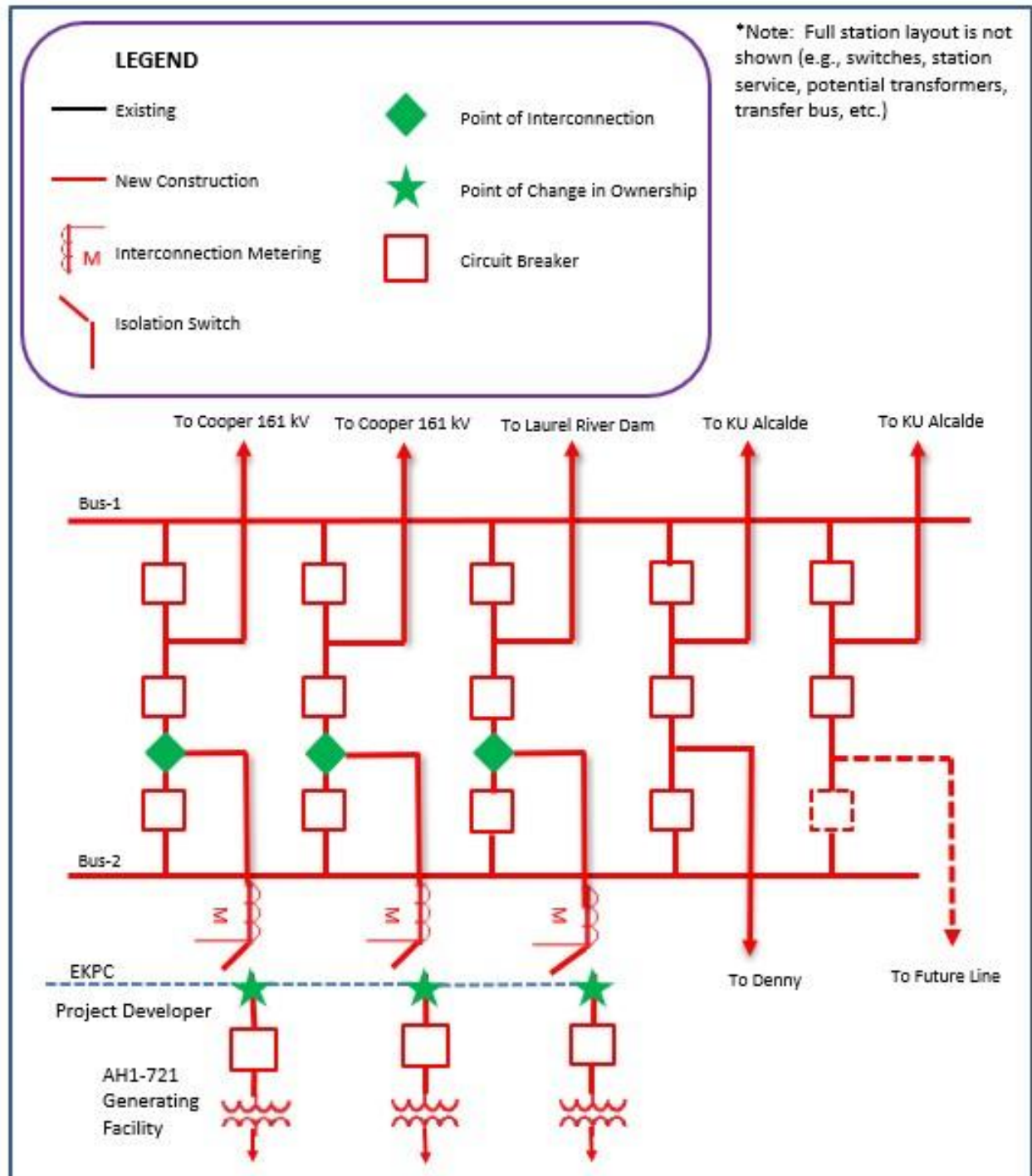
Attachment #1: Single line Diagram for the Physical Interconnection

Attachment #2: Substation General Arrangement

Attachment 1:

Single Line Diagram for the Physical Interconnection

AH1-721 Conceptual One-Line Diagram of Interconnection Facilities East Cooper 161 kV Substation



Attachment 2:

Substation General Arrangement

