PJM Facilities Study Report

For

Network Upgrade N5318.1

Cycle TC1/DPP-2019

May 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff and PJM Manuals. The Transmission Owner (TO) is ComEd.

A. Project Description

The System Impact Study for PJM Interconnection Cycle TC1/DPP-2019 has identified the need for PJM Network Upgrade N5318.1. The scope of this Network Upgrade includes the following:

- Rebuild entire 345kV transmission line L.97104 from TSS 971 Prairie to TSS 138 Silver Lake (approximately 24.7 miles).
- Replace static wire with OPGW that contains single-mode 48 count fiber. Install 48-ct FDP at TSS 138 Silver Lake and TSS 971 Prairie to account for new OPGW.
- Upgrade the existing substation TSS138 Silver Lake by replacing existing circuit breaker 345kV BT 3-4 & associated disconnect switches and replacing the line disconnect switch for 345kV line 97104.
- Upgrade relay & protection at 345kV substation TSS 138 Silver Lake to support upgrade of 345kV transmission line, 97104.

Upon completion of the Network Upgrade above, the expected final ratings will be:

- 345kV line 97104 will have a final rating of 1448/1863/1975/2232 MVA SN/SLTE/SSTE/SLD.
- TSS 138 Silver Lake 345kV BT 3-4 circuit breaker and corresponding MODs will have a final rating of 3126/3367/4022/4805 A SN/SLTE/SSTE/SLD in accordance with EP-4034-E.
- TSS 138 Silver Lake Line 97104 MOD will have a final rating of 3448/3909/4504/5342 A SN/SLTE/SSTE/SLD.

The scope of Network Upgrade is shown in Attachment #1.

B. Transmission Owner Facilities Study Results

1. Detailed scope of work for Network Upgrade N5318.1:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N5318.1. These facilities shall be designed according to the Transmission Owner's Applicable Technical Requirements and Standards. Once built the Transmission Owner will own, operate, and maintain these facilities.

- 345kV transmission line 97104 will be rebuilt in its entirety from TSS 971 Prairie to TSS 138 Silver Lake. All existing structures will be replaced with new single-, double-, or triple-circuit steel monopoles. Approximately 24.7 circuit miles of new TP 1113 kcmil "Bluejay"

ACSR conductor will be installed. New 48-ct OPGW will be installed in one static position. 7#6 Alumoweld will be installed in the second static position. The following structures will be replaced:

Structure Number	Existing Structure Type	New Structure Type
4005, 4006, 4007	EM10363	Deadend
4008, 4009, 4010	EM10362	Deadend
4004	EM10367	Deadend
4011	EM10368	Deadend
76-D, 77, 77-D, 78	H-Frame	Suspension
142, 146, 167, 168, 175, 176, 185, 186	A+0	Suspension
133, 134, 135, 136, 137, 138, 139, 139-D, 140, 141, 150, 151, 152, 155, 158, 159, 170, 171, 180, 188, 191, 194, 196, 197	A+5	Suspension
147, 148, 154, 157, 160, 166, 187, 190, 193	A+10	Suspension
132, 144, 149, 156	A+15	Suspension
143, 145, 153, 192, 199	A+20	Suspension
169, 189	A+25	Suspension
183	A+30	Suspension
184, 200	A+35	Suspension
172, 182	A+45	Suspension
179	A+50	Suspension
161, 162, 163, 164	B+5	Suspension
165, 195, 198	B+10	Suspension
181	B+55	Suspension
177	BM+0	Deadend
173	BM+10	Deadend
174	BM-15	Deadend
178	BM-20	Deadend
131	E+10	Deadend
201	E+25	Deadend
125	HDE-5	Deadend

Structure Number	Existing Structure Type	New Structure Type
113	HDE-20	Deadend
83	HS-10	Suspension
67, 68, 72, 74, 76, 90, 96, 103, 109, 110, 116, 117, 118, 120, 123, 124	LSV+0	Suspension
70, 81, 94	LSV+5	Suspension
107	LSV+15	Suspension
69, 71, 73, 80, 82, 85, 86, 87, 88, 89, 91, 92, 98, 99, 100, 101, 102, 104, 105, 106, 108, 111, 114, 115, 119, 121, 122, 130	LSV-10	Suspension
93, 95, 112	MS1V+0	Suspension
75, 79, 84, 97	MS1V-10	Suspension

TSS 971 Prairie

- Review and reset relay settings for 345kV L.97104 87L-1 & 87L-2.
- Install new 48-ct FDP in control building to connect to OPGW fiber to/from TSS 138 Silver Lake.

TSS 156 Cherry Valley

- Review and reset relay settings for 345kV L.15616 87L-1 & 87L-2.

TSS 138 Silver Lake

- Review and reset relay settings for 345kV L.97104 87L-1 & 87L-2.
- Replace existing 345kV BT3-4 OCB with a 345kV 2.0-cycle IPO breaker with a minimum nameplate capability of 3126/3367/3500/4022 A SN/SLTE/SSTE/SLD continuous and interrupting capability of 63kA at -40°F. Circuit breaker shall have a CT ratio of 3000:5. The ratings of the existing breaker (2283/2557/2664/3089 A) as specified in EP-4034-E dated 03/31/08 does not satisfy the minimum rating of 2232/2888/3074/3488 A (1334/1726/1837/2084 MVA) specified in PS5318.1. Therefore, the new breaker is required.
- New BT3-4 CB shall include an internal SEL-2411 for breaker monitoring.
- Upgrade 345kV BT3-4 Breaker Failure relay to SEL-451 per GDD2303. Connect new SEL-451 to existing dual-switch architecture.
- Replace existing 2338 MCM ACAR cable between 345kV Line 97104 dead-end and 345kV line 97104 MOD with a cable that has a minimum rating of 3126/3367/4022/4805 A.

- Replace existing line disconnect switch and motor operator for 345kV line 97104. New line MOD to have a minimum rating of 3126/3367/4022/4805 A.
- All other series and terminal equipment with station conductor meets or exceeds a minimum thermal capability of 2232/2888/3074/3488 A (1334/1726/1837/2084 MVA).

2. MILESTONE SCHEDULE FOR COMPLETION OF COMED WORK

Facilities outlined in this report are estimated to take 60 months to construct, from the time of full execution of the Generation Interconnection Agreement and completion of a construction kickoff call. 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	15
Permitting/Procurement	15	52
Construction	46	60

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- This cost estimates assume that work will be performed during normal weekdays and with no overtime. Transmission line outages for construction have not been identified, but generally are available from September to May. These outages are controlled by PJM.
- Costs are based on 2025 rates and do not reflect a potential increase in Labor or Material costs after 2025.
- The Project Developer(s) will be responsible to request and bear the cost for relocation of existing transmission or distribution lines (including structures and other facilities) that may be required for transmission line crossings, the transport of any large equipment, such as turbines, rotors, turbine structures, cranes, etc. Formal submittal of this request to ComEd's TSO for ultimate review by PJM can be made 7 months prior to back feed request date.
- ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- Foundation design assumes typical soil conditions at locations and will be subject to change after soil boring tests.
- All upgrades to facilities included in this document will be required to meet latest ComEd standards.
- Upgrades are subject to change based on detailed design development.

- ComEd will complete pre-design and post construction survey for the transmission and substation upgrades, as required. This includes, but is not limited to, the LIDAR survey and video imaging for transmission lines. Costs associated with this are at the expense of the Project Developer(s). Pre-design survey must be completed prior to detailed engineering.
- This study assumes that there will be no additional right-of-way and/or easement work required.
- This Facilities Study is time dependent. If the project is not into construction within one year of the issuance, the study will be void and the project re-studied, requiring the completion of a new Facilities Study.
- It is assumed that all PJM Phase 2 projects are complete prior to this Network Upgrade.
    - This scope assumes that TSS 971 Prairie has been built, and any associated relay, SCADA, and communication upgrades at TSS 138 Silver Lake have been completed.
- This line is in a corridor with an ultimate build plan. A rebuild of this line in the future may require a mix of structure types to satisfy the ultimate build. However, these costs are not included in this facility study report.

4. LAND REQUIREMENTS

No additional easements, access rights, or temporary or permanent real property rights or acquisitions were identified as required for network upgrades to the ComEd system within this study. However, as further needs are assessed in detailed engineering, design and/or construction activities, if it is determined that there is a need for easements, access rights, or temporary or permanent real property rights or acquisitions, the developer is fully responsible for the costs to acquire these required land rights. Also, as necessary, the schedule will be adjusted accordingly to account for the necessary time to obtain these required land rights. All easements, access rights, or temporary or permanent real property rights or acquisitions shall comply with all ComEd requirements as detailed in “Land requirements for Interconnection Substations”.

5. ENVIRONMENTAL AND PERMITING

- ComEd will be responsible to obtain all environmental approvals and permitting required. This includes any endangered species studies and monitoring, as required. Costs associated with this permitting are at the expense of the Project Developer(s).
- The Project Developer(s) will be responsible for site restoration required for transmission upgrades. This includes, but is not limited to road restoration/improvements, wetland restoration, and farm field restoration/crop damage. Costs associated with this are at the expense of the Project Developer(s).
- The Project Developer(s) will be responsible for the cost to purchase real estate or obtain the necessary right-of-way easement for all upgrades associated with this project. These associated upgrades are not included in the costs listed in this study.

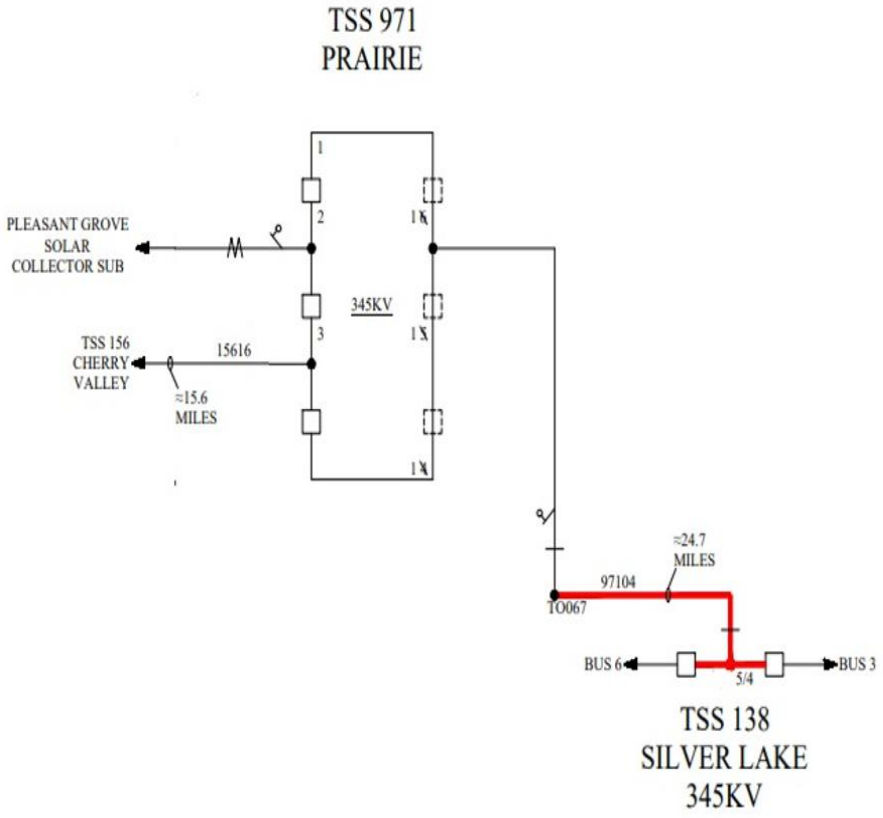
- The Project Developer(s) will be responsible for remediation costs for locations found to have environmental contaminations and remediation. This may require contaminated soil disposal as well as lead paint removal for existing structure work.
- It is assumed that all necessary permits will be obtained in a timely manner to allow engineering and construction to proceed according to the Milestone Schedule.
- It is assumed that conveyance of property and rights will be obtained to support the PJM Transmission Outage Schedule.
- It is assumed that the required Environmental Study will yield no impediments to the development of the site.
- ComEd will complete geotechnical soil borings, resistivity study, and analysis for substation and transmission upgrades. Costs associated with this are at the expense of the Project Developer(s).

C. APPENDICES

Attachment #1: Single line Diagram for the Network Upgrade

Attachment #2: Plan and Profile Drawing (attached separately)

Attachment #1: Single Line Diagram for Network Upgrade



Attachment #2 (attached separately)