



2017 RTEP Proposal Window 1

2017 RTEP Generation Deliverability

[Public Version]

Submitted August 25, 2017

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A. Executive Summary

As part of the first 2017 PJM Regional Transmission Expansion Plan (RTEP) Proposal Window, Duquesne Light Company (DLC) is submitting a proposal to mitigate several of the violations as identified within the 2022 Summer Generator Deliverability study. Specifically, this proposal addresses the thermal violations of the Allenport-Charleroi, Smithton-Yukon, and Shepler Hill Junction-Smithton 138 kV circuits identified in Flow Gates 577, 578, 581, 582, 583, 584, and 857. This proposal will reduce the post contingency flows through each of these circuits to below 100% of their associated emergency facility rating.

The DLC proposal addresses these violations in a cost-effective and efficient manner by creating two (2) new 138 kV tie-lines between DLC and the Allegheny Power (APS) area of the FirstEnergy (FE) transmission system. By reconfiguring the DLC-owned Cheswick-Plum and the APS-owned Springdale-Wycoff-Yukon 138 kV circuits to become the Springdale-Plum and Cheswick-Wycoff-Yukon 138 kV circuits, the thermal violations identified within the Generator Deliverability Study are alleviated.

The estimated total cost for this proposal is \$4,487,509, with a projected in-service date of 5/31/2021.

DLC intends to be the Designated Entity to construct, own, operate, and maintain this project.

B. DLC Evaluation Information

Company Name and Address:

Duquesne Light Company
411 Seventh Avenue
Pittsburgh, PA 15219

Pre-Qualification Submittal Identification

Number:
Q13-17

Primary Point of Contact:

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DLC’s Pre-Qualification package can be found on PJM’s website at the following location:

<http://www.pjm.com/-/media/planning/rtep-dev/expansion-plan-process/ferc-order-1000/pre-qualification-duquesne-light-company-updated.ashx?la=en>

C. Project Constructability

Violations Addressed by Proposal

This proposal mitigates the thermal violations of the Allenport-Charleroi, Smithton-Yukon, and Shepler Hill Junction-Smithton 138 kV circuits as identified in Flow Gates 577, 578, 581, 582, 583, 584, and 857. Additionally, this proposal also decreases the thermal loading of the Butler-Shanor Manor and Shanor Manor-Krendale 138 kV circuits, which were identified with thermal violations in Flow Gates 44 and 53.

Scope of Proposal

This proposal recommends the reconfiguration of the DLC-owned Cheswick-Plum and APS-owned Springdale-Wycoff-Yukon 138 kV circuits to create two (2) new tie lines between DLC and APS. These two (2) circuits were built using overhead construction and their routes intersect [REDACTED]. As such, DLC recommends the installation of a new steel monopole at the intersection of these circuits where they would then be reconfigured to become the Cheswick-Wycoff-Yukon and Springdale-Plum 138 kV DLC-APS tie-lines. An additional three (3) DLC structures adjacent to the point of interconnection would be replaced with steel monopoles to help mitigate the elevations differences between the DLC and APS circuits.

DLC also recommends reconductoring the section of the future Springdale-Plum 138 kV tie line (currently the DLC-owned Cheswick-Plum 138 kV circuit) from the point of interconnection to the Plum substation with 795 ACSS high temperature 20/7 strand conductor. Power flow analyses have predicted that an increase in flow will occur on this portion on this circuit due to the reconfiguration and therefore cause thermal overloads. This section of conductor is approximately 2.9 miles in length.

Route Description & Land

DLC owns the property in which its current structures are located and in which the four (4) new steel monopoles will be installed, as such, no new land must be acquired. Additionally, new conductor will be utilized on a portion of the reconfiguration. The new conductor is heavier, more resistance to wind, and able to be strung at higher tensions, as such, no new right-of-way is expected to be acquired to facilitate.

The point of interconnection is [REDACTED] which is rural in nature with several residential plans in the area. Due to the physical characteristics of the area, the current existence of transmission facilities in the area, and the avoidance of encroaching upon new property, it is not anticipated that any significant public opposition would be encountered.

Required Outages

To install four (4) new steel monopoles and reconfigure the appropriate circuits as identified above, a 30 day outage would be required for the Cheswick-Plum, Springdale-Wycoff-Yukon, and Springdale-Huntingdon 138 kV circuits. An additional three (3) to five (5) month outage would be required for the newly established Springdale-Plum 138 kV circuit in order to complete its reconductor.

Project Cost by Component

The following costs are associated with the DLC proposal as discussed above:

Project Component	Description	Cost Estimate
1.	DLC installation of four (4) new steel monopoles and reconfiguration of the DLC Cheswick-Plum, APS Springdale-Wycoff-Yukon, and APS Springdale-Huntingdon 138 kV circuits.	\$1,973,457
2.	DLC to reconductor approximately 3 miles of the newly established Springdale-Plum 138 kV tie line.	\$1,964,052
3.	APS costs to perform tower engineering studies and relay modifications.	\$550,000
Total Estimated Cost:		\$4,487,509

Identification of Construction Responsibility

DLC would assume primary responsibility for the project construction/execution and would coordinate with APS as necessary.

Illustrations of the proposal to supplement the description in the section above can be found in Figure 1 through Figure 5.

Figure 1 – One-Line Showing the Proposed Point of Interconnection Between DLC & APS

[Redacted Single Line Drawing]

Figure 2 - Overview of the DLC and APS 138 kV Circuit Crossing

[Redacted Aerial Snapshot]

Figure 3 - Magnified View of DLC and APS 138 kV Circuit Crossing

[Redacted Aerial Snapshot]

Figure 4 - DLC and APS Tower Identification

[Redacted Aerial Snapshot]

Figure 5 - Location of New Steel Monopoles and Proposed New Circuit Configuration

[Redacted Aerial Snapshot]

D. Analytical Assessment

Steady State Analysis

The Siemens Power Technologies International Load Flow program (PSS/E) was used to perform a thermal analysis of the transmission system. The base case utilized for this study was provided by PJM for the 2022 RTEP proposal window. The contingency files supplied with the case were updated to reflect the changes resulting from this proposal. The additional contingencies are being provided to PJM with this proposal. These contingency files were used to test for NERC Category P1, Category P2, Category P4, and Category P7 contingencies. NERC Category P3 & P6 (N-1-1) were tested using the global double contingency command inherent to PSS/E.

The steady state analysis indicated that the proposed solution addressed the identified violations and that there were no new thermal violations. The summary of the Summer Generator Deliverability Thermal results with and without the proposed project are listed in Table 1.

Table 1 - Thermal Analysis Results

[Redacted Thermal Results Table]

Short Circuit Analysis

A short circuit analysis was performed using CAPE to analyze the impacts of the proposed project. The study was performed using a 2022 PJM Short Circuit databased that was equalized by PJM specifically for the DLC system. DLC converted the PJM database to the CAPE format which was then used for this assessment.

The short circuit analysis indicated that this proposal does not increase the maximum fault duty of any breakers beyond their rated fault duty.

E. Cost

Total Project Cost in 2017 Dollars: \$4,487,509

Total Project Cost in 2021 Dollars: \$5,050,731¹

A detailed breakdown of project estimated costs have been provided in Table 2:

Table 2 - Detailed Breakdown of Project Costs

Component 1	Installation of monopoles and reconfiguration of the DLC and APS Circuits	
	<i>Engineering</i>	14%
	<i>Siting</i>	0%
	<i>Materials</i>	35%
	<i>Construction</i>	50%
	<i>Project/Construction Mgmt.</i>	< 1%
Estimated Component 1 Cost:		\$1,973,457
Component 2	Reconductor Portion of Springdale-Plum 138 kV Circuit	
	<i>Engineering</i>	5%
	<i>Siting</i>	8%
	<i>Materials</i>	10%
	<i>Construction</i>	76%
	<i>Project/Construction Mgmt.</i>	< 1%
Estimated Component 2 Cost:		\$1,964,052
Component 3	APS Engineering and Relay Modifications	
	<i>Engineering</i>	TBD
	<i>Siting</i>	TBD
	<i>Materials</i>	TBD
	<i>Construction</i>	TBD
	<i>Project/Construction Mgmt.</i>	TBD
Estimated Component 3 Cost:		\$550,000
Total Estimated Project Cost:		\$4,487,509*

* All project costs include overheads.

Table 3 identifies the approximate percentage of the total estimated project cost DLC will spend each year:

Table 3 - Project Spend per Year

Year	% Spend of Total Project Cost
2018	15%
2019	15%
2020	30%
2021	40%

¹ Assumes a 3% annual inflation rate over a 4 year period

F. Schedule

The proposed project schedule is detailed below and assumes that PJM has assigned DLC to be the Designated Entity prior to July 31, 2018. All modifications to the 138 kV circuits would occur within already owned property or within pre-existing right-of-way. The modifications within this proposal would require approval from the Pennsylvania Public Utility Commission. It should also be noted that based on 52 Pa. Code § 57.72, the scope of this project meets the requirements for approval with a Letter of Notification rather than a full siting application, thereby expediting the regulatory review process and avoiding a lengthy, iterative application proceeding. This enables DLC to remedy the identified violations in a timely manner and meet an in-service date of May 31, 2021.

Activity	Timeframe
Engineering	8/1/2018 - 5/31/2019
Siting	4/1/2019 - 8/31/2019
Procurement	9/1/2019 - 9/31/2020
Construction	10/1/2020 - 5/31/2021
In-Service Date	5/31/2021

G. Operations/Maintenance

DLC's Pre-Qualification package can be found on PJM's website at the following location:

<http://www.pjm.com/-/media/planning/rtep-dev/expan-plan-process/ferc-order-1000/pre-qual-duquesne-light-company-updated.ashx?la=en>

Attachments

The following documents have been included as attachments to this proposal:

- (1) DLC 2017 RTEP Proposal Window 1 - Added Contingencies.con
- (2) DLC 2017 RTEP Proposal Window 1 - Proposed Project.idv

Attachment (1)
DLC 2017 RTEP Proposal Window 1 - Added
Contingencies.con

[Redacted Contingency File]

[Redacted Contingency File]

Attachment (2)
DLC 2017 RTEP Proposal Window 1 –
Proposed Project.idv

[Redacted Automation File]