

# Lackawanna T3 and T4 Transformer 230 kV Retermination Upgrade

## General Information

|                                                                                                               |                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposing entity name                                                                                         | Proprietary Information                                                                                                                                                                                  |
| Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project? | Proprietary Information                                                                                                                                                                                  |
| Company proposal ID                                                                                           | Proprietary Information                                                                                                                                                                                  |
| PJM Proposal ID                                                                                               | 127                                                                                                                                                                                                      |
| Project title                                                                                                 | Lackawanna T3 and T4 Transformer 230 kV Retermination Upgrade                                                                                                                                            |
| Project description                                                                                           | Reterminate the Lackawanna T3 and T4 500 / 230 kV transformers on the 230 kV side to remove them from the 230 kV buses and bring them into dedicated bay positions that are not adjacent to one another. |
| Email                                                                                                         | Proprietary Information                                                                                                                                                                                  |
| Project in-service date                                                                                       | 01/2026                                                                                                                                                                                                  |
| Tie-line impact                                                                                               | No                                                                                                                                                                                                       |
| Interregional project                                                                                         | No                                                                                                                                                                                                       |
| Is the proposer offering a binding cap on capital costs?                                                      | Yes                                                                                                                                                                                                      |
| Additional benefits                                                                                           | Proprietary Information                                                                                                                                                                                  |

## Project Components

1. Lackawanna 500/230 kV T3 and T4 Transformer Retermination

### Substation Upgrade Component

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| Component title     | Lackawanna 500/230 kV T3 and T4 Transformer Retermination |
| Project description | Proprietary Information                                   |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Substation name          | Lackawanna 500/230 kV Substation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Substation zone          | PPL EU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Substation upgrade scope | Re-terminate T4 into bay #1 in the east position. Install two 230 kV 4000 A breakers and four 230 kV 4000 A MODs. Install one tie and one 230 kV dead-end structure, two 230 kV switch structures, and three 230 kV insulator support structures and associated foundations. The transformer lead conductors will be updated to 2-1590 ACSR. Re-terminate T3 into bay #2 in the west position. Install one 230 kV 4000 A breaker and two 230 kV 4000 A MODs. This will include adding one tie and one 230 kV dead-end structure, and the removal of three 230 kV post insulator structures. Two foundations will be required for the transformer lead dead-end structures, and conductors will be updated to 2-1590 ACSR. Remove the existing 230 kV T3 and T4 transformer low-side breakers. |

**Transformer Information**

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| New equipment description                          | Installation of three new 230 kV circuit breakers, six new 230 kV MODs, added 230 kV bus, relay panels, associated high-side jumpers, control cables, power cables, conduit, new foundation for new equipment, and associated grounding. T3 will have a rating of SN 890 MVA, SE 1167 MVA, WN 1114 MVA and WE 1200 MVA. T4 will have a rating of SN 880 MVA, SE 1145 MVA, WN 1101 MVA, and WE 1200 MVA.                                                                                |
| Substation assumptions                             | The substation is owned by the proposing entity and space is sufficient to accommodate this upgrade. No assumptions were necessary. Bay #1 of the 230kV yard is open and currently has no equipment installed. Bay #2 has two breakers accommodating one 230kV line and has an open position terminal on the west side of the bay. Transformers T3 and T4 can remain in their existing position and can be re-terminated into bay positions by modifying the transformer 230 kV leads. |
| Real-estate description                            | Substation space sufficient to accommodate upgrade. No station expansion required.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Construction responsibility                        | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Benefits/Comments                                  | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Component Cost Details - In Current Year \$</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Engineering & design                               | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Permitting / routing / siting                      | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ROW / land acquisition                             | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Materials & equipment                              | Proprietary Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                  |                         |
|----------------------------------|-------------------------|
| Construction & commissioning     | Proprietary Information |
| Construction management          | Proprietary Information |
| Overheads & miscellaneous costs  | Proprietary Information |
| Contingency                      | Proprietary Information |
| Total component cost             | \$10,658,539.20         |
| Component cost (in-service year) | \$11,903,458.27         |

## Congestion Drivers

None

## Existing Flowgates

| FG #          | Fr Bus No. | From Bus Name | To Bus No. | To Bus Name | CKT | Voltage | TO Zone | Analysis type    | Status   |
|---------------|------------|---------------|------------|-------------|-----|---------|---------|------------------|----------|
| 2022W1-GD-S59 | 5208009    | LACK          | 200074     | LACK        | 3   | 230/500 | 229     | Summer Gen Deliv | Included |

## New Flowgates

None

## Financial Information

|                              |         |
|------------------------------|---------|
| Capital spend start date     | 04/2023 |
| Construction start date      | 08/2024 |
| Project Duration (In Months) | 33      |

## Cost Containment Commitment

|                            |                         |
|----------------------------|-------------------------|
| Cost cap (in current year) | Proprietary Information |
| Cost cap (in-service year) | Proprietary Information |

## Components covered by cost containment

1. Lackawanna 500/230 kV T3 and T4 Transformer Retermination - PPL

## Cost elements covered by cost containment

|                                                      |                         |
|------------------------------------------------------|-------------------------|
| Engineering & design                                 | Yes                     |
| Permitting / routing / siting                        | Yes                     |
| ROW / land acquisition                               | Yes                     |
| Materials & equipment                                | Yes                     |
| Construction & commissioning                         | Yes                     |
| Construction management                              | Yes                     |
| Overheads & miscellaneous costs                      | Yes                     |
| Taxes                                                | No                      |
| AFUDC                                                | No                      |
| Escalation                                           | No                      |
| Additional Information                               | Proprietary Information |
| Is the proposer offering a binding cap on ROE?       | No                      |
| Is the proposer offering a Debt to Equity Ratio cap? | Proprietary Information |

## Additional Comments

None