# Kammer - 502 Junction 765 kV Line

## General Information

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|---|---|
| Proposing entity name | Confidential Information |
| Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project? | Confidential Information |
| Company proposal ID | Confidential Information |
| PJM Proposal ID | 727 |
| Project title | Kammer - 502 Junction 765 kV Line |
| Project description | Convert the existing Kammer - 502 Junction 500 kV Line to 765 kV. Install two 765/500 kV transformers at 502 Junction Substation by relocating the existing Kammer 765/500 kV transformer and installing a new 765/500 kV transformer. There is not sufficient room at Kammer Substation to accommodate an additional 765/500 kV transformer installation. |
| Email | Confidential Information |
| Project in-service date | 12/2029 |
| Tie-line impact | Yes |
| Interregional project | No |
| Is the proposer offering a binding cap on capital costs? | No |
| Additional benefits | Confidential Information |

## Project Components

1. Kammer - 502 Junction 765 kV Line
2. 502 Junction Substation Expansion
3. Kammer 765/500 kV Transformer Relocation

## Transmission Line Upgrade Component

| | |
|---|---|
| Component title | Kammer - 502 Junction 765 kV Line |
| Project description | Confidential Information |
| Impacted transmission line | Kammer - 502 Junction 500 kV Line |
| Point A | Kammer |
| Point B | 502 Junction |
| Point C | |
| Terrain description | The new Kammer - 502 Junction 765 kV Line will be constructed in the existing Kammer - 502 Junction 500 kV Line corridor. |
| Existing Line Physical Characteristics | |
| Operating voltage | 500 kV |
| Conductor size and type | 2 x 2032.1 kcmil 72/7 ACSR |
| Hardware plan description | No existing hardware will be utilized as this line will be completely rebuilt. |
| Tower line characteristics | The 765 kV line utilizes a combination of self-supporting and guyed-V lattice tower construction that is horizontally configured. The predominant structure type will be guyed-V suspension towers supported by a center grillage and four bridge-strand anchors. Self-supporting suspension towers, running-corner suspension towers, and tension structures will utilize concrete drilled piers to support foundation loads. Self-supporting suspension structures will be used to the extent possible as an effort to keep electrical infrastructure compatible with agricultural use. |

Proposed Line Characteristics

| | Designed | Operating |
|---|---|---|
| Voltage (kV) | 765.000000 | 765.000000 |
| | Normal ratings | Emergency ratings |
| Summer (MVA) | 6392.000000 | 7737.000000 |

| | | |
|---|---|---|
| Winter (MVA) | 8012.000000 | 8445.000000 |
| Conductor size and type | 6x 795 kcmil ACSR 45/7 | |
| Shield wire size and type | 7#9 alumoweld | |
| Rebuild line length | 15.6 miles (AEP) , 26.3 miles (FirstEnergy) | |
| Rebuild portion description | 15.6 miles (AEP) , 26.3 miles (FirstEnergy) | |
| Right of way | No new right of way will be required, as the new Kammer - 502 Junction 765 kV Line will be constructed in the existing Kammer - 502 Junction 500 kV Line corridor. | |
| Construction responsibility | Confidential Information | |
| Benefits/Comments | Confidential Information | |
| Component Cost Details - In Current Year $ | | |
| Engineering & design | Confidential Information | |
| Permitting / routing / siting | Confidential Information | |
| ROW / land acquisition | Confidential Information | |
| Materials & equipment | Confidential Information | |
| Construction & commissioning | Confidential Information | |
| Construction management | Confidential Information | |
| Overheads & miscellaneous costs | Confidential Information | |
| Contingency | Confidential Information | |
| Total component cost | $201,599,999.00 | |
| Component cost (in-service year) | $219,460,000.00 | |

## Substation Upgrade Component

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|---|---|
| Component title | 502 Junction Substation Expansion |

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|---|---|
| Project description | Confidential Information |
| Substation name | 502 Jct |
| Substation zone | 201 |
| Substation upgrade scope | Purchase (4) new 765/500 kV single phase transformers. Three single phase units will be energized at 502 Jct and one unit will be utilized as a spare. Relocate the (4) existing 765/500 kV single phase transformers from Kammer Substation to 502 Jct Substation. Three single phase units will be energized at 502 Jct and one unit will be utilized as a spare. Install (1) 765 kV Circuit Breaker. Install (4) sets of 765 kV MOAB Disconnect Switches. Install (1) 765 kV Dead-end Structures. Install (3) 765 kV CCVTs. Install (3) 765 kV Surge Arresters. Install (2) 500 kV Circuit Breakers. Install (7) 500 kV MOAB Disconnect Switches. Install (3) 500 kV Deadend Structures. Install (3) 500 kV CCVTs. Install (3) 500 kV Surge Arresters. Install (1) prefabricated control building with battery system, AC & DC aux power panels, security cabinet, and MPLS network equipment. Install (1) lot of cables and grounding for new control house. Install (1) lot of cables, steel structures, grounding, rigid and strain bus, and fittings. Install (1) lot of fencing for substation yard expansion. Relocate 0.21 miles of the common-tower 502 Jct - Whiteley #1 and #2 138 kV Lines by removing (2) wooden structures and installing (3) new wooden structures. Relaying & Control: Install (1) line protection panel consisting of (2) SEL-411L relays. Install (2) transformer protection panels consisting of (1) SEL-587, (1) SEL-487E, (1) SEL-451 & (1) SEL-421 relays each. Install (2) transformer lead protection panel consisting of (2) SEL-421 relays. Install (3) breaker control panels consisting of (1) SEL-451 relay each. Install (1) HMI panel with GPS clock and RTAC. Install (1) SCADA RTU. Install (1) ATS. Install (1) fiber patch panel. |

## Transformer Information

| | Name | Capacity (MVA) |
|---|---|---|
| Transformer | 502 Jct No. 1 765/500 kV Transformer (Existing Kammer Unit) | 2994/3805 MVA SN/SE |

| | High Side | Low Side | Tertiary |
|---|---|---|---|
| Voltage (kV) | 765 | 500 | 13.8 |

| | Name | Capacity (MVA) |
|---|---|---|
| Transformer | 502 Jct No. 2 765/500 kV Transformer | 3125/4000 MVA SN/SE |

| | High Side | Low Side | Tertiary |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Voltage (kV) | 765 | 500 | 13.8 |
| New equipment description | All new terminal equipment to be rated 5000 A. | | |
| Substation assumptions | - The substation fence at 502 Jct Substation will be expanded. - There will be a new control building for 765 kV equipment. Control cables between buildings may be required. - Interconnection metering will be at AEP Kammer Substation. - OPGW will be added if direct fiber relaying is required by protection on the 502 Junction-Kammer 765 kV Line. - SCADA work is included in this cost. - No tree clearing restrictions. - Environmental Permitting can be obtained in 1 Year with no time-of-year clearing restrictions. Environmental Assumptions: - Road Bonds are required. - Environmental Filming (Documentation of Existing roads are required). - Environmental Access and Road Crossing Permit Fees is required. - Environmental Development of Permit Binder is required. - Environmental Cultural Resource Consultation is required. | | |
| Real-estate description | No real estate acquisition will be required. | | |
| Construction responsibility | Confidential Information | | |
| Benefits/Comments | Confidential Information | | |
| Component Cost Details - In Current Year $ | | | |
| Engineering & design | Confidential Information | | |
| Permitting / routing / siting | Confidential Information | | |
| ROW / land acquisition | Confidential Information | | |
| Materials & equipment | Confidential Information | | |
| Construction & commissioning | Confidential Information | | |
| Construction management | Confidential Information | | |
| Overheads & miscellaneous costs | Confidential Information | | |
| Contingency | Confidential Information | | |
| Total component cost | $85,859,888.36 | | |
| Component cost (in-service year) | $96,141,926.00 | | |

## Substation Upgrade Component

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|---|---|
| Component title | Kammer 765/500 kV Transformer Relocation |
| Project description | Confidential Information |
| Substation name | Kammer |
| Substation zone | 205 |
| Substation upgrade scope | Relocate the existing 765/500 kV transformer at Kammer Substation to 502 Jct Substation. |

## Transformer Information

None

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|---|---|
| New equipment description | N/A |
| Substation assumptions | N/A |
| Real-estate description | 502 Jct Substation fence will be expanded on the existing 502 Jct Substation property. |
| Construction responsibility | Confidential Information |
| Benefits/Comments | Confidential Information |

Component Cost Details - In Current Year $

| | |
|---|---|
| Engineering & design | Confidential Information |
| Permitting / routing / siting | Confidential Information |
| ROW / land acquisition | Confidential Information |
| Materials & equipment | Confidential Information |
| Construction & commissioning | Confidential Information |
| Construction management | Confidential Information |
| Overheads & miscellaneous costs | Confidential Information |
| Contingency | Confidential Information |

| | |
|---|---|
| Total component cost | $5,000,000.00 |
| Component cost (in-service year) | $5,630,000.00 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|
| 2024W1-GD-S344 | 242925 | 05KAMMER | 235117 | 01KAMMER | 1 | 765/500 | 201/205 | Summer Gen Deliv | Included |
| 2024W1-GD-S349 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | Summer Gen Deliv | Included |
| 2024W1-GD-S342 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | Summer Gen Deliv | Included |
| 2024W1-GD-S333 | 242925 | 05KAMMER | 235117 | 01KAMMER | 1 | 765/500 | 201/205 | Summer Gen Deliv | Included |
| 2024W1-GD-S346 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | Summer Gen Deliv | Included |
| 2024W1-GD-S356 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | Summer Gen Deliv | Included |
| 2024W1N1SVM71 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-GD-S338 | 242925 | 05KAMMER | 235117 | 01KAMMER | 1 | 765/500 | 201/205 | Summer Gen Deliv | Included |
| 2024W1-32GD-S12 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | 2032 Summer Gen Deliv | Included |
| 2024W1N1SVM72 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-32GD-S11 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | 2032 Summer Gen Deliv | Included |
| 2024W1N1SVM69 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-GD-S337 | 242925 | 05KAMMER | 235117 | 01KAMMER | 1 | 765/500 | 201/205 | Summer Gen Deliv | Included |
| 2024W1-32GD-S10 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | 2032 Summer Gen Deliv | Included |
| 2024W1N1SVM70 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-GD-S339 | 242925 | 05KAMMER | 235117 | 01KAMMER | 1 | 765/500 | 201/205 | Summer Gen Deliv | Included |
| 2024W1-GD-S350 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | Summer Gen Deliv | Included |
| 2024W1N1SVM75 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1N1SVM73 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-32GD-S14 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | 2032 Summer Gen Deliv | Included |

| FG # | Fr Bus No. | From Bus Name | To Bus No. | To Bus Name | CKT | Voltage | TO Zone | Analysis type | Status |
|---|---|---|---|---|---|---|---|---|---|
| 2024W1N1SVM74 | 235111 | 01 502 J | 235111 | 01 502 J | 1 | 500 | 201 | Summer Voltage Magnitude | Included |
| 2024W1-32GD-S13 | 235117 | 01KAMMER | 235111 | 01 502 J | 1 | 500 | 201 | 2032 Summer Gen Deliv | Included |

## New Flowgates

Confidential Information

## Financial Information

| | |
|---|---|
| Capital spend start date | 01/2025 |
| Construction start date | 04/2025 |
| Project Duration (In Months) | 59 |

## Additional Comments

Please call or email with any questions.