

NORTHEAST TRANSMISSION DEVELOPMENT

a Member of the LS Power Group

PROPOSALS



In Response to the:

PJM RTEP – 2016 RTEP Proposal Window #2

August 15, 2016

NORTHEAST TRANSMISSION DEVELOPMENT

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NORTHEAST TRANSMISSION DEVELOPMENT

A. EXECUTIVE SUMMARY

Northeast Transmission Development, LLC (“NTD”), a member of the LS Power Group (“LS Power”) is pleased to present the following projects (individually “Project” or collectively “Projects”) to resolve potential reliability criteria violations identified by PJM. The potential reliability criteria violations were identified in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria) for the 2016 RTEP Proposal Window #2.

NTD seeks to be the Designated Entity¹ for these Projects, designated by PJM to develop, construct, own, operate, maintain, and finance the Projects. NTD has demonstrated its capability to develop, finance, construct, own and operate large scale power projects, including high-voltage transmission projects. LS Power has a strong track record of success throughout the United States, including significant generation experience and the successful development, construction, and operation of hundreds of miles of high-voltage transmission.

The Projects are described below. NTD provides cost containment for each of the Projects to cap the costs to place each Project in-service. Each Project should be evaluated independently and can be placed in service in advance of the identified need of June 1, 2021.

1. BOOKERS RUN - (2016_2-9A)

The Project consists of a new Bookers Run 230 kV switching station with a series reactor connecting the existing Muddy Run to Peach Bottom 230 kV transmission line and Peach Bottom Tap to Cooper 230 kV transmission line. The Project has an estimated construction cost of approximately \$12.5 million and will resolve generator deliverability violations in southeastern Pennsylvania.

2. BOOKERS RUN – GRACETON - (2016_2-9B)

The Project consists of a new approximately 7-mile 230 kV transmission line connecting the new Bookers Run 230 kV switching station along the existing Muddy Run-Peach Bottom 230 kV transmission line to the existing Graceton 230 kV substation. The Project has an estimated construction cost of approximately \$19.2 million and will resolve generator deliverability violations in southeastern Pennsylvania.

3. BUTCHERS RUN - (2016_2-9C)

The Project consists of a new Butchers Run 138 kV switching station connecting the existing Cabrey Junction to Butler 138 kV transmission line, the existing Cabrey Junction to Bredinville 138 kV transmission line, the existing Cabrey Junction to Cabot 138 kV transmission line and the existing Lawson to MC Calmont 138 kV transmission line. The Project has an estimated construction cost of

¹ Pre-qualification ID 13-06.

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approximately \$7.4 million and will resolve thermal and generator deliverability violations in western Pennsylvania.

4. CHESTNUT RIDGE - (2016_2-9D)

The Project consists of a new Chestnut Ridge 500/345 kV substation interconnecting the existing Keystone to Conemaugh 500 kV transmission line and the existing Homer City 345 kV substation. The Project has an estimated construction cost of approximately \$23.0 million and will resolve a generator deliverability violation in western Pennsylvania.

5. DOGWOOD RUN 230 kV - (2016_2-9F)

The Project consists of a new Dogwood Run 230/115 kV substation interconnecting the existing Allen to Roundtop 115 kV transmission line and the existing William Grove 230 kV substation. The Project has an estimated construction cost of approximately \$13.3 million and will resolve a thermal violation in southeastern Pennsylvania.

6. DOGWOOD RUN 500 kV - (2016_2-9G)

The Project consists of a new Dogwood Run 500/115 kV substation interconnecting the existing Juniata to Three Mile Island 500 kV transmission line and the existing Allen to Roundtop 115 kV transmission line. The Project has an estimated construction cost of approximately \$18.7 million and will resolve a thermal violation in southeastern Pennsylvania.

7. EUGENE – MEADOW LAKE - (2016_2-9I)

The Project consists of a new approximately 64-mile 345 kV transmission line connecting the existing Eugene 345 kV switching station to the existing Meadow Lake 345 kV switching station. The Project has an estimated construction cost of approximately \$80.5 million and will resolve thermal and generator deliverability violations in western Indiana.

8. GREENTREE - (2016_2-9J)

The Project consists of a new approximately 1.5-mile 345 kV transmission line connecting the existing Garver 345 kV substation to a new Greentree 345/138 kV substation which connects to the existing Rockies Express 138 kV substation. The Project has an estimated construction cost of approximately \$17.0 million and will resolve thermal and generator deliverability violations in southwestern Ohio.

9. METZ/RICHWOOD HILLS LOOP – DENTS RUN - (2016_2-9O)

The Project consists of a new approximately 4-mile double circuit connection from the existing Richwood Hills to Metz 138 kV transmission line to the existing Dents Run 138 kV substation. The Project has an estimated construction cost of approximately \$9.3 million and will resolve a thermal violation in northern West Virginia.

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10. ORSON RUN & PEACH BOTTOM – GRACETON - (2016_2-9P)

The Project consists of a new approximately 5-mile 230 kV transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to a new Orson Run 230 kV switching station interconnecting the existing Safe Harbor to Graceton 230 kV transmission line. The existing Muddy Run to Peach Bottom 230 kV transmission line will be reconfigured to have a Muddy Run to Orson Run 230 kV line and the remaining 230 kV transmission line to Peach Bottom will be removed from service. The Project also includes a new approximately 7-mile 230 kV transmission line connecting the existing Peach Bottom 230 kV substation to the existing Graceton 230 kV substation. The Project has an estimated construction cost of approximately \$26.8 million and will resolve generator deliverability violations in southeastern Pennsylvania.

11. ORSON RUN - (2016_2-9Q)

The Project consists of a new approximately 5-mile 230 kV transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to a new Orson Run 230 kV switching station interconnecting the existing Safe Harbor to Graceton 230 kV transmission line. The existing Muddy Run to Peach Bottom 230 kV transmission line will be reconfigured to have a Muddy Run to Orson Run 230 kV line and the remaining 230 kV transmission line to Peach Bottom will be removed from service. The Project has an estimated construction cost of approximately \$13.4 million and will resolve generator deliverability violations in southeastern Pennsylvania.

12. PADDYS RUN - (2016_2-9R)

The Project consists of a new Paddys Run 345/138 kV substation interconnecting the existing Miami Fort to West Milton 345 kV transmission line, the existing Morgan to Fairfield 138 kV transmission line and the existing Willey to Fairfield 138 kV transmission line. The Project has an estimated construction cost of approximately \$18.7 million and will resolve thermal and generator deliverability violation in southwestern Ohio.

13. PATTERSON RUN - (2016_2-9S)

The Project consists of a new Patterson Run 138 kV switching station connecting the existing Bull Creek to Cabot 138 kV transmission line, the existing Bull Creek to Houseville 138 kV transmission line, the existing Bull Creek to Mountain Gathering 138 kV transmission line, the existing Lawson to Cabot 138 kV transmission line, the existing Lawson to Fawn 138 kV transmission line, and the existing Lawson to MC Calmont 138 kV transmission line. The Project has an estimated construction cost of approximately \$12.1 million and will resolve thermal and generator deliverability violations in western Pennsylvania.

14. RAMSEY - (2016_2-9T)

The Project consists of a new Ramsey 138 kV switching station connecting the existing Clifty Creek to Northwest 138 kV transmission line and the existing Madison to Madison West 138 kV transmission line.

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The Project has an estimated construction cost of approximately \$6.1 million and will resolve generator deliverability violations in southeastern Indiana.

15. SOUGAN - (2016_2-9V)

The Project consists of a new Sougan 138 kV switching station connecting the existing Orebank to Holston 138 kV transmission line, the existing Orebank to Wolf Hills 138 kV transmission line, and the existing Indian Springs to North Bristol 138 kV transmission line. The Project has an estimated construction cost of approximately \$12.1 million and will resolve generator deliverability violations in northeastern Tennessee.

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B. COMPANY EVALUATION INFORMATION

NTD is a member of the LS Power Group,² an experienced developer of large-scale energy projects, including several transmission projects. Since 1990, LS Power has had the technical and engineering capability to develop, own and/or operate over 30,000 MW of power generation facilities and two large high-voltage (345 kV and 500 kV) transmission projects totaling over 700 circuit-miles. LS Power currently has operating assets and development projects within PJM in Delaware, Illinois, Kentucky, New Jersey, Pennsylvania and Virginia. Additional information confirming NTD's qualifications to be selected as the Designated Entity was included in the pre-qualification documentation.

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C. CONSTRUCTABILITY

A general Project location map for all Projects can be found in *Appendix A*. A more detailed map depicting each representative location can be found in *Appendix B*.

1. BOOKERS RUN

The Project consists of a new Bookers Run 230 kV switching station with a series reactor connecting the existing Muddy Run to Peach Bottom 230 kV transmission line and Peach Bottom Tap to Cooper 230 kV transmission line.

A. BOOKERS RUN 230 kV SWITCHING STATION

The primary component of the Project consists of a new 230 kV switching station with a series reactor interconnecting the existing Muddy Run to Peach Bottom 230 kV transmission line and the existing Peach Bottom Tap to Cooper 230 kV transmission line. The new Bookers Run switching station is proposed to be located on privately-owned land in York County, Pennsylvania.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Muddy Run to Peach Bottom 230 kV transmission line and the existing Peach Bottom Tap to Cooper 230 kV transmission line to the new Bookers Run 230 kV switching station.

2. BOOKERS RUN - GRACETON

The Project consists of a new approximately 7-mile 230 kV transmission line connecting the new Bookers Run 230 kV switching station along the existing Muddy Run-Peach Bottom 230 kV transmission line to the existing Graceton 230 kV substation.

A. GRACETON 230 kV SUBSTATION INTERCONNECTION

The first component of the Project consists of interconnecting to the Graceton 230 kV substation and associated terminal improvements. This work would be completed by the incumbent transmission owner.

B. GRACETON – BOOKERS RUN 230 kV TRANSMISSION LINE

The second component of the Project is a new approximately 7-mile 230 kV overhead single circuit transmission line interconnecting the existing Graceton 230 kV substation to a new Bookers Run 230 kV switching station. The representative route is located in Harford County in Maryland and York County in Pennsylvania.

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C. BOOKERS RUN 230 kV SWITCHING STATION

The third component of the Project consists of a new 230 kV switching station interconnecting the new 230 kV line to Graceton and the existing Muddy Run to Peach Bottom 230 kV transmission line. The new Bookers Run switching station is proposed to be located on privately-owned land in York County, Pennsylvania.

D. TRANSMISSION LINE INTERCONNECTION

The fourth component of the Project is constructing new towers to connect the existing Muddy Run to Peach Bottom 230 kV transmission line to the new Bookers Run 230 kV switching station.

E. MUDDY RUN TO PEACH BOTTOM 230 kV TRANSMISSION LINE UPGRADE

The fifth component of the Project is upgrading approximately 0.25 miles of the existing Muddy Run to Peach Bottom 230 kV transmission line.

3. BUTCHERS RUN

The Project consists of a new Butchers Run 138 kV switching station connecting the existing Cabrey Junction to Butler 138 kV transmission line, the existing Cabrey Junction to Bredinville 138 kV transmission line, the existing Cabrey Junction to Cabot 138 kV transmission line and the existing Lawson to MC Calmont 138 kV transmission line.

A. BUTCHERS RUN 230 kV SWITCHING STATION

The primary component of the Project consists of a new Butchers Run 138 kV switching station connecting the existing Cabrey Junction to Butler 138 kV transmission line, the existing Cabrey Junction to Bredinville 138 kV transmission line, the existing Cabrey Junction to Cabot 138 kV transmission line and the existing Lawson to MC Calmont 138 kV transmission line. The new Butchers Run switching station is proposed to be located on privately-owned land in Butler County, Pennsylvania.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Cabrey Junction to Butler 138 kV transmission line, the existing Cabrey Junction to Bredinville 138 kV transmission line, the existing Cabrey Junction to Cabot 138 kV transmission line and the existing Lawson to MC Calmont 138 kV transmission line to the new Butchers Run switching station.

4. CHESTNUT RIDGE

The Project consists of a new Chestnut Ridge 500/345 kV substation interconnecting the existing Keystone to Conemaugh 500 kV transmission line and the existing Homer City 345 kV substation.

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A. CHESTNUT RIDGE 500/345 kV SUBSTATION

The primary component of the Project consists of a new Chestnut Ridge 500/345 kV substation interconnecting the existing Keystone to Conemaugh 500 kV transmission line and the existing Homer City 345 kV substation. The new Chestnut Ridge substation is proposed to be located on privately-owned land in Indiana County, Pennsylvania.

B. TRANSMISSION LINE INTERCONNECTION

The second component of the Project is constructing new towers to connect the existing Keystone to Conemaugh 500 kV transmission line to the new Chestnut Ridge substation.

C. HOMER CITY 345 kV SUBSTATION INTERCONNECTION

The third component of the Project consists of interconnecting to the Homer City 345 kV substation and associated terminal improvements. This work would be completed by the incumbent transmission owner.

5. DOGWOOD RUN 230 kV

The Project consists of a new Dogwood Run 230/115 kV substation interconnecting the existing Allen to Roundtop 115 kV transmission line and the existing William Grove 230 kV substation.

A. DOGWOOD RUN 230/115 kV SUBSTATION

The first component of the Project consists of a new Dogwood Run 230/115 kV substation interconnecting the existing Allen to Roundtop 115 kV transmission line and the existing Williams Grove 230 kV substation. The new Dogwood Run 230 kV substation is proposed to be located on privately-owned land in Cumberland County, Pennsylvania.

B. DOGWOOD RUN 230 – ALLEN/ROUNDTOP 115 kV TRANSMISSION LINE

The second component of the Project is a new approximately 2.5-mile 115 kV overhead double circuit transmission line looping the existing Allen to Roundtop 115 kV transmission line into the new Dogwood Run 230 kV substation. The representative route is located in York County and Cumberland County in Pennsylvania.

C. WILLIAMS GROVE 230 kV SUBSTATION INTERCONNECTION

The third component of the Project consists of interconnecting to the Williams Grove 230 kV substation and associated terminal improvements. This work would be completed by the incumbent transmission owner.

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6. DOGWOOD RUN 500 kV

The Project consists of a new Dogwood Run 500/115 kV substation interconnecting the existing Juniata to Three Mile Island 500 kV transmission line and the existing Allen to Roundtop 115 kV transmission line.

A. DOGWOOD RUN 500/115 kV SUBSTATION

The primary component of the Project consists of a new Dogwood Run 500/115 kV substation interconnecting the existing Juniata to Three Mile Island 500 kV transmission line and the existing Allen to Roundtop 115 kV transmission line. The new Dogwood Run 500 kV substation is proposed to be located on privately-owned land in Cumberland County, Pennsylvania.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Juniata to Three Mile Island 500 kV transmission line and the existing Allen to Roundtop 115 kV transmission line.

7. EUGENE – MEADOW LAKE

The Project consists of a new approximately 64-mile 345 kV transmission line connecting the existing Eugene 345 kV switching station to the existing Meadow Lake 345 kV switching station.

A. EUGENE 345 kV SWITCHING STATION INTERCONNECTION

The first component of the Project consists of interconnecting to the Eugene 345 kV switching station and associated terminal improvements. This work would be completed by the incumbent transmission owner.

B. EUGENE – MEADOW LAKE 345 kV TRANSMISSION LINE

The second component of the Project is a new approximately 64-mile 345 kV overhead single circuit transmission line connecting the existing Eugene 345 kV switching station to the existing Meadow Lake 345 kV switching station. The representative route is located in Vermillion County, Fountain County, Warren County, Tippecanoe County and White County in Indiana.

C. MEADOW LAKE 345 kV SWITCHING STATION INTERCONNECTION

The third component of the Project consists of interconnecting to the Meadow Lake 345 kV switching station and associated terminal improvements. This work would be completed by the incumbent transmission owner.

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8. GREENTREE

The Project consists of a new approximately 1.5-mile 345 kV transmission line connecting the existing Garver 345 kV substation to a new Greentree 345/138 kV substation which connects to the existing Rockies Express 138 kV substation

A. GARVER 345 kV SWITCHING STATION INTERCONNECTION

The first component of the Project consists of interconnecting to the Garver 345 kV switching station and associated terminal improvements. This work would be completed by the incumbent transmission owner.

B. GARVER - GREENTREE 345 kV TRANSMISSION LINE

The second component of the Project is a new approximately 1.5-mile 345 kV overhead single circuit transmission line connecting the existing Garver 345 kV substation to a new Greentree 345/138 kV substation. The representative route is located in Butler County and Warren County in Ohio.

C. GREENTREE 345/138 kV SUBSTATION

The third component of the Project consists of a new Greentree 345/138 kV substation interconnecting the new Garver to Greentree 345 kV transmission line and the existing Rockies Express 138 kV substation. The new Greentree substation is proposed to be located on privately-owned land in Warren County, Ohio.

D. ROCKIES EXPRESS 138 kV SUBSTATION INTERCONNECTION

The fourth component of the Project consists of interconnecting to the Rockies Express 138 kV substation and associated terminal improvements.

9. METZ-RICHWOOD HILLS LOOP TO DENTS RUN

The Project consists of a new approximately 4-mile double circuit connection from the existing Richwood Hills to Metz 138 kV transmission line to the existing Dents Run 138 kV substation.

A. DENTS RUN – METZ/RICHWOOD HILLS 138 kV TRANSMISSION LINE

The primary component of the Project is a new approximately 4-mile 138 kV overhead double circuit transmission line looping in the existing Richwood Hills to Metz 138 kV transmission line. The representative route is located in Marion County, West Virginia.

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B. DENTS RUN 138 kV SUBSTATION INTERCONNECTION

The other component of the Project consists of interconnecting to the Dents Run 138 kV Substation and associated terminal improvements.

10. ORSON RUN & PEACH BOTTOM - GRACETON

The Project consists of a new approximately 5-mile 230 kV transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to a new Orson Run 230 kV switching station interconnecting the existing Safe Harbor to Graceton 230 kV transmission line. The existing Muddy Run to Peach Bottom 230 kV transmission line will be reconfigured to have a Muddy Run to Orson Run 230 kV line and the remaining 230 kV transmission line to Peach Bottom will be removed from service. The Project also includes a new approximately 7-mile 230 kV transmission line connecting the existing Peach Bottom 230 kV substation to the existing Graceton 230 kV substation.

A. MUDDY RUN/PEACH BOTTOM – ORSON RUN 230 kV TRANSMISSION LINE

The first component of the Project is a new approximately 5-mile 230 kV overhead single circuit transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to the new Orson Run 230 kV switching station. The representative route is located in York County, Pennsylvania.

B. ORSON RUN 230 kV SWITCHING STATION

The second component of the Project consists of a new Orson Run 230 kV switching station looping in the existing Safe Harbor to Graceton 230 kV transmission line and the new 230 kV transmission line to the existing Muddy Run to Peach Bottom 230 kV transmission line. The new Orson Run substation is proposed to be located on privately-owned land in York County, Pennsylvania.

C. MUDDY RUN TO PEACH BOTTOM 230 kV TRANSMISSION LINE RECONFIGURATION

The third component of the Project is reconfiguring the existing Muddy Run to Peach Bottom 230 kV transmission line to have a Muddy Run to Orson Run 230 kV line. Remove the remaining 230 kV transmission line to Peach Bottom from service. This work would be completed by the incumbent transmission owner.

D. PEACH BOTTOM – GRACETON 230 kV TRANSMISSION LINE

The fourth component of the Project is a new approximately 8-mile 230 kV overhead single circuit transmission line interconnecting the existing Graceton 230 kV substation to the existing Peach Bottom 230 kV substation. The representative route is located in Harford County in Maryland and York County in Pennsylvania.

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E. GRACETON 230 kV SUBSTATION INTERCONNECTION

The fifth component of the Project consists of interconnecting to the Graceton 230 kV substation and associated terminal improvements. This work would be completed by the incumbent transmission owner.

F. PEACH BOTTOM 230 kV SUBSTATION INTERCONNECTION

The sixth component of the Project consists of interconnecting to the Peach Bottom 230 kV substation and associated terminal improvements. This work would be completed by the incumbent transmission owner.

11. ORSON RUN

The Project consists of a new approximately 5-mile 230 kV transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to a new Orson Run 230 kV switching station interconnecting the existing Safe Harbor to Graceton 230 kV transmission line. The existing Muddy Run to Peach Bottom 230 kV transmission line will be reconfigured to have a Muddy Run to Orson Run 230 kV line and the remaining 230 kV transmission line to Peach Bottom will be removed from service.

A. MUDDY RUN/PEACH BOTTOM – ORSON RUN 230 kV TRANSMISSION LINE

The first component of the Project is a new approximately 5-mile 230 kV overhead single circuit transmission line from the existing Muddy Run to Peach Bottom 230 kV transmission line to the new Orson Run 230 kV switching station. The representative route is located in York County, Pennsylvania.

B. ORSON RUN 230 kV SWITCHING STATION

The second component of the Project consists of a new Orson Run 230 kV switching station looping in the existing Safe Harbor to Graceton 230 kV transmission line and the new 230 kV transmission line to the existing Muddy Run to Peach Bottom 230 kV transmission line. The new Orson Run substation is proposed to be located on privately-owned land in York County, Pennsylvania.

C. MUDDY RUN TO PEACH BOTTOM 230 kV TRANSMISSION LINE RECONFIGURATION

The third component of the Project is reconfiguring the existing Muddy Run to Peach Bottom 230 kV transmission line to have a Muddy Run to Orson Run 230 kV line. Remove the remaining 230 kV transmission line to Peach Bottom from service. This work would be completed by the incumbent transmission owner.

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12. PADDYS RUN

The Project consists of a new Paddys Run 345/138 kV substation interconnecting the existing Miami Fort to West Milton 345 kV transmission line, the existing Morgan to Fairfield 138 kV transmission line and the existing Willey to Fairfield 138 kV transmission line.

A. PADDYS RUN 345/138 kV SUBSTATION

The primary component of the Project consists of a new Paddys Run 345/138 kV substation interconnecting the existing Miami Fort to West Milton 345 kV transmission line, the existing Morgan to Fairfield 138 kV transmission line and the existing Willey to Fairfield 138 kV transmission line. The new Paddys Run substation is proposed to be located on privately-owned land in Hamilton County, Ohio.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Miami Fort to West Milton 345 kV transmission line, the existing Morgan to Fairfield 138 kV transmission line and the existing Willey to Fairfield 138 kV transmission line.

13. PATTERSON RUN

The Project consists of a new Patterson Run 138 kV switching station connecting the existing Bull Creek to Cabot 138 kV transmission line, the existing Bull Creek to Houseville 138 kV transmission line, the existing Bull Creek to Mountain Gathering 138 kV transmission line, the existing Lawson to Cabot 138 kV transmission line, the existing Lawson to Fawn 138 kV transmission line, and the existing Lawson to MC Calmont 138 kV transmission line.

A. PATTERSON RUN 138 kV SWITCHING STATION

The primary component of the Project consists of a new Patterson Run 138 kV switching station connecting the existing Bull Creek to Cabot 138 kV transmission line, the existing Bull Creek to Houseville 138 kV transmission line, the existing Bull Creek to Mountain Gathering 138 kV transmission line, the existing Lawson to Cabot 138 kV transmission line, the existing Lawson to Fawn 138 kV transmission line, and the existing Lawson to MC Calmont 138 kV transmission line. The new Patterson Run switching station is proposed to be located on privately-owned land in Butler County, Pennsylvania.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Bull Creek to Cabot 138 kV transmission line, the existing Bull Creek to Houseville 138 kV transmission line, the existing Bull Creek to Mountain Gathering 138 kV transmission line, the existing Lawson to Cabot 138 kV transmission line, the existing Lawson to Fawn 138 kV transmission line, and the existing Lawson to MC Calmont 138 kV transmission line.

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14. RAMSEY

The Project consists of a new Ramsey 138 kV switching station connecting the existing Clifty Creek to Northwest 138 kV transmission line and the existing Madison to Madison West 138 kV transmission line.

A. RAMSEY 138 kV SWITCHING STATION

The primary component of the Project consists of a new Ramsey 138 kV switching station connecting the existing Clifty Creek to Northwest 138 kV transmission line and the existing Madison to Madison West 138 kV transmission line. The new Ramsey switching station is proposed to be located on privately-owned land in Jefferson County, Indiana.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Clifty Creek to Northwest 138 kV transmission line and the existing Madison to Madison West 138 kV transmission line.

15. SOUGAN

The Project consists of a new Sougan 138 kV switching station connecting the existing Orebank to Holston 138 kV transmission line, the existing Orebank to Wolf Hills 138 kV transmission line, and the existing Indian Springs to North Bristol 138 kV transmission line.

A. SOUGAN 138 kV SWITCHING STATION

The primary component of the Project consists of a new Sougan 138 kV switching station connecting the existing Orebank to Holston 138 kV transmission line, the existing Orebank to Wolf Hills 138 kV transmission line, and the existing Indian Springs to North Bristol 138 kV transmission line. The new Sougan switching station is proposed to be located on privately-owned land in Sullivan County, Tennessee.

B. TRANSMISSION LINE INTERCONNECTION

The other component of the Project is constructing new towers to connect the existing Orebank to Holston 138 kV transmission line, the existing Orebank to Wolf Hills 138 kV transmission line, and the existing Indian Springs to North Bristol 138 kV transmission line.

D. ANALYTICAL ASSESSMENT

The Project one-line diagrams can be found in *Appendix C* and a preliminary sketch of the proposed configuration can be found in *Appendix D*.

NTD determined the technical specifications for each Project including ratings and impedances, which are each specified in the modeling files submitted for review by PJM. NTD has completed an extensive modeling effort to evaluate the merits of the Projects. The model results demonstrate that the Projects will resolve potential reliability criteria violations as identified in *Appendix E*.

NTD conducted a power flow contingency analysis using the power flow case and contingency files provided by PJM to identify any potential violations of thermal ratings due to the addition of a Project. NTD's analysis showed no Projects created new thermal overloads on the PJM system.

E. COST

1. PROJECT COST ESTIMATES

The total cost for each Project, both in current year dollars and in-service year dollars, and a detailed breakdown of estimated costs for each component of each Project is identified in *Appendix F*.

An estimated yearly cash flow for each Project is included as *Appendix G*.

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F. SCHEDULE

NTD has prepared execution plans for all Project components outlining major Project development, construction and operations activities. NTD identified and evaluated any potential fatal flaws for all Projects and confirmed the preliminary feasibility of each Project proposed for consideration by PJM. A detailed conceptual schedule for each proposed Project component can be found in *Appendix K*. NTD's schedule allots sufficient time to complete each aspect of the Project to meet an in-service date as early as June 1, 2020 without risking a delay if unforeseen issues would arise. NTD has proposed a June 1, 2020 in-service date in circumstances where it would appear appropriate to be in-service earlier to resolve the identified violation. NTD will meet the in-service date directed by PJM.

LS Power will assign a Project Director to oversee the Project through development, construction and operations/maintenance. *Appendix L* contains an organizational chart depicting the management structure NTD intends to implement the Project. The following sections summarize each of the major activities during the development, construction, and operations and maintenance phases of the Project.

A. SITE SELECTION/ROUTING ANALYSIS

NTD will conduct a detailed analysis to identify preferred and alternative routes/sites taking into consideration factors such as safety, environmental impacts and land use. The detailed analysis will include data collection, field evaluation, environmental review, engineering analysis, right-of-way review and agency and public review. The detailed analysis will identify all information necessary to support development of the application for any siting approval process.

B. COMMUNITY AND LANDOWNER ENGAGEMENT

NTD will identify and engage stakeholders, such as community officials and landowners within the Project area, early in the process and maintain an active dialogue throughout. Public meetings may be held to offer a venue for landowners and other interested community members to learn about the Project and for NTD to learn more about specific landowner and community preferences. NTD plans to make information available on its website and provide notification of public meetings to landowners within the Project area as required in the siting approval process.

C. PERMITTING

As with all of LS Power's development projects, LS Power employees will directly oversee all Project permitting activities. From senior management to project managers and environmental, electrical and project engineers to support services including legal, administrative, regulatory and others, the Project will benefit from LS Power's detail-oriented and hands-on philosophy. In addition to LS Power personnel, NTD will utilize qualified third-party firms to support permitting and development efforts. In its experience, LS Power has found that working with local consultants and legal counsel provides both invaluable insight and the benefit of established relationships with permitting agencies. Additionally, LS

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Power has strong working relationships with numerous equipment manufacturers, suppliers, contractors and engineers to provide specialized technical data as necessary to support permitting; such information includes, for example, the most current equipment offerings and respective performance data, construction techniques to minimize impacts and permitting complexity and procurement and installation schedules. NTD has already held preliminary discussions with third-party support firms to confirm expectations on schedule and feasibility for permitting processes, procurement and construction, which information is incorporated in this Proposal. NTD will be involved in each step of the development process, carefully managing and reviewing work to ensure the various aspects of the Project fit together upon completion, ultimately being financeable and constructible.

D. SITING APPROVAL

Most high-voltage transmission projects will require a state siting approval. To begin the siting approval process, NTD plans to hold pre-application meetings with the regulatory agency to introduce NTD and the Project, as well as confirm its understanding of the process. Shortly thereafter, NTD will simultaneously begin collecting siting data and start its outreach efforts so that public siting input is incorporated at the earliest stages of the Project. Once NTD identifies a preferred site/route and at least one viable alternative site/route, NTD will carry out the environmental and detailed engineering work described in the Site Selection/Routing Analysis section above in order to establish a highly-detailed Project plan to support the siting applications.

E. WETLANDS AND WATERWAYS

All proposed Projects were sited to avoid and minimize impacts to wetlands or other areas of environmental concern based on GIS data. It is possible that a Project cannot avoid impacts to a limited number of wetlands and waterways. If so, NTD expects the Project will be subject to regulation under certain permitting programs, namely Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 401 of the Clean Water Act. NTD will engage a qualified consultant to conduct a wetlands delineation of the selected site/route in order to establish the extent of proposed impacts and the need for specific permits from the state or U.S. Army Corps of Engineers.

F. VARIOUS MINOR PERMITS

In addition to the permits described above, NTD has identified other permits which may be required for the construction of the Project. NTD considers these permits to be minor due to the more limited effort to prepare applications and the less intensive permitting processes which follow. These include permits related to airspace clearance, stormwater/erosion and sedimentation control, road crossings, and utility and railroad crossings.

NORTHEAST TRANSMISSION DEVELOPMENT

G. RIGHT-OF-WAY ACQUISITION

The Project will be located primarily on new right-of-way to be acquired by NTD predominately in the form of easements. NTD will assign a Right-of-Way Manager to oversee all real estate related activities for the Project including appraisals, title work, surveying, land acquisition and restoration.

A land valuation study will be prepared to establish acreage values for the Project area to serve as the basis for consistent offers for securing easements. Title work will be prepared for each parcel and provided to the survey team for use in preparing legal descriptions for each easement. A right-of-way agent will contact each property owner in person to explain the Project and, as necessary, secure permission to conduct surveys, archaeological studies, etc. Right-of-way agents will be the primary point of contact and negotiate with property owners to acquire the easements on a mutually agreeable basis. To the extent that negotiations reach an impasse, NTD will be able to pursue eminent domain. The right-of-way agents will continue to act as a liaison with the property owners during construction and through the restoration process.

H. PROJECT CONSTRUCTION

NTD intends to follow the same approach for construction as was most recently used to construct the Cross Texas Transmission facilities in Texas. NTD will assign a Construction Manager, an Engineering Manager and a Permit/Compliance Manager to oversee, construction, engineering and compliance activities. This will include quality assurance, field inspectors, coordination activities, outage planning, document control, and various specialists. *Appendix L* provides an organizational structure depicting NTD's planned management arrangement.

NORTHEAST TRANSMISSION DEVELOPMENT

G. OPERATIONS/MAINTENANCE

For all Project components, NTD intends to follow the same approach for operations and maintenance as is being used for the Cross Texas Transmission Facilities in Texas. NTD will maintain a reliable system and ensure safety and compliance with all applicable codes and standards. NTD will assign a Planning and Operations Manager to oversee the planning, maintenance, real-time operations, and emergency response activities. NTD will actively monitor the condition of the Project, perform condition based maintenance activities and replace equipment as needed. *Appendix L* provides an organizational structure depicting NTD's planned management arrangement.

1. OPERATIONS PLAN

NTD will have a transmission operations center to provide 24/7 monitoring of the Project to monitor and control voltage levels, power flows, or other parameters of the Project, as well as implement procedures needed for emergency or planned maintenance.

2. MAINTENANCE PLAN

NTD will implement an active, thorough inspection and maintenance program for the Project consistent with industry practices including transmission line inspections, vegetative and right-of-way maintenance, and substation maintenance.