



PJM 2014/15 RTEP Long-Term Proposal Window

Project Submittal: DATC AP South Relief

Duke - American Transmission Co.

-PUBLIC VERSION-

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Executive Summary

Introduction

Duke-American Transmission Company, LLC (DATC) is pleased to submit this Market Efficiency Project proposal in response to the PJM 2014/15 RTEP Long-Term Proposal Window.

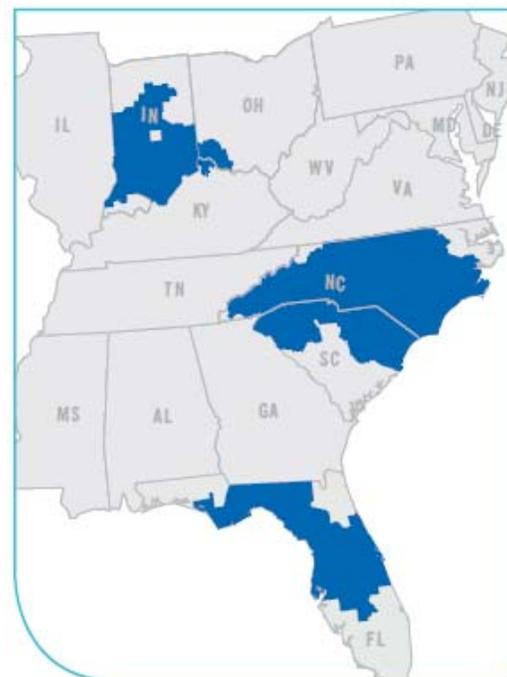
DATC is a joint venture of Duke Energy Transmission Holding Company, LLC (Duke Energy) and American Transmission Company, LLC (ATC). DATC was established in 2011 to build, own and operate electric transmission infrastructure in North America. Equity ownership of DATC is split equally between Duke Energy Transmission, a wholly owned indirect subsidiary of Duke Energy Corporation, and ATC. DATC is governed by a four-member board of managers including two representatives from each of the parent companies.

Duke Energy

Duke Energy is a Fortune 250 company with over \$100 billion in assets and is the largest electric power holding company in the United States; with regulated utility operations serving approximately 7.5 million electric customers in a service territory covering 104,000 square miles in six states in the Southeast and Midwest. Duke Energy owns and operates approximately 32,000 miles of transmission lines and 57,700 megawatts of generating capacity from a diverse mix of coal, nuclear, natural gas, oil and renewable resources.



- *Nation's largest electric power holding company serving more than 7.1 million customers in six states*
- *Owns approximately 32,000 miles of transmission lines*
- *Interest in DATC is held by Duke Energy's Commercial Businesses*
- *Fortune 250 company; NYSE: DUK*
- *Headquartered in North Carolina*



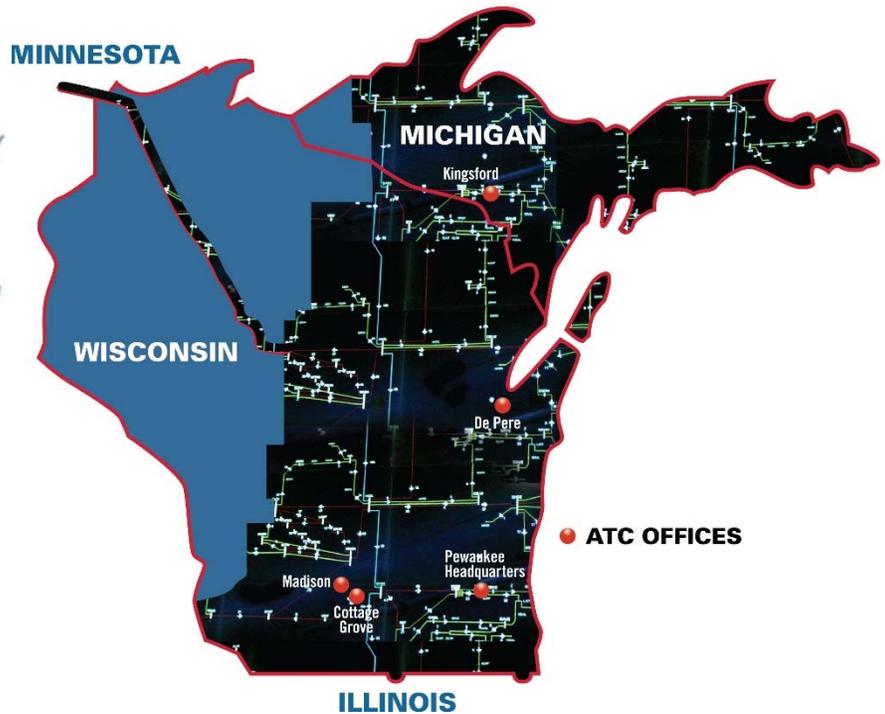
Duke Energy Service Territory

ATC

Formed in 2001 as the nation's first multi-state transmission-only utility, ATC owns and operates more than 9,500 miles of transmission lines and 530 substations, a system serving portions of Wisconsin, Michigan, Minnesota and Illinois.



- Nation's first multi-state transmission-only utility
- Formed in 2001
- Invested \$3.5 billion in building more than 2,800 miles of transmission lines in the past 14 years in four Midwestern states: Wisconsin, Michigan, Minnesota and Illinois
- Excellent track record of project approvals
- Owns and operates more than 9,500 miles of transmission lines and 530 substations
- Headquartered in Wisconsin



Problem Statement

PJM is seeking technical solution alternatives to resolve market efficiency congestion on the AP South Interface. PJM's Market Efficiency Analysis shows significant congestion on this interface in the 2015, 2019, 2022 and 2025 study years. DATC proposes the DATC AP South Relief Project ("the Project") to address this market efficiency congestion.

Qualifications and Intent

In 2013 DATC satisfied the pre-qualification requirements for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement (PJM OA) in Section 1.5.8(a). DATC's PJM pre-qualification ID is Q13-16.

The information on record with PJM as posted on PJM's website and as revised in a September 2014 memo to PJM updating the executive leadership team reflects the current qualifications of DATC.

If the Project is selected by PJM to resolve the problem statement, DATC intends to be considered the Designated Entity to construct, own, operate, maintain and finance the Project.

Project Overview

[REDACTED]

Name and Address of Proposing Entity

Questions and comments regarding this proposal should be directed Paul Jett, Vice President of DATC.

[REDACTED]

Company Evaluation Information

DATC Qualifications

DATC has satisfied the pre-qualification requirements for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement (PJM OA) in Section 1.5.8(a). DATC's PJM pre-qualification ID is Q13-16.

DATC's pre-qualification document on file with PJM describes DATC's capabilities related to being a designated entity, including:

- Technical and engineering qualifications relevant to construction, operation and maintenance of the Project.
- Experience in developing, constructing, operating and maintaining the types of facilities included in the Project.
- Experience adhering to standardized construction, maintenance and operating practices, including the capability for emergency response and restoration of damaged equipment.
- Experience acquiring real estate and rights of way.

Duke Energy and ATC own and operate approximately 10 percent of the nation's transmission system, over 41,000 miles of lines, with over \$12 billion in transmission assets. DATC has alliances with firms across the country to provide local experience and expertise on a project-specific basis.

DATC does not have experience working in the local area of the Project, but will partner with consultants who have local expertise, similar to the process that has been used on the DATC Zephyr Power Transmission project, an 850 mile Direct Current line to deliver Wyoming wind energy to the southwestern U.S. and California.

DATC's development of the Zephyr Power Transmission Project included extensive transmission line routing and substation siting studies. DATC partnered with Natural Resources Group, an environmental permitting consultant, and POWER Engineers to perform transmission line routing studies of more than 5,000 miles of potential routes in seven states. The routing analysis considered more than 200 potential environmental and land use constraints on federal, state and private lands. DATC narrowed the potential route alternatives to an 850-mile route in four states and invited stakeholder feedback at public open houses in 18 counties in Wyoming, Colorado, Utah and Nevada. In addition to hosting more than 800 landowners at the 18 open houses, stakeholder outreach activities also included holding more than 100 meetings with local leaders and elected officials and engaging with several Native American tribes and environmental stakeholders. Robust web resources that included GIS mapping tools and dozens of fact sheets provided interested stakeholders with information on routing and siting, engineering, environmental topics, landowner easements, routes,

and information on health and agricultural topics. The input helped DATC understand local impacts and explore and develop several route alternatives for the Zephyr Power Transmission project. POWER Engineers worked with DATC to conduct preliminary substation engineering and design plans sufficient to enable the project to continue to be studied by regional planners in the Western Electric Coordinating Council. The vast experience of Duke Energy and ATC, two of the nation's leading transmission utilities, led DATC to adopt industry best practices to execute an inclusive stakeholder outreach plan that helped inform the routing and siting studies performed by DATC and our consultants.

DATC intends to contract out for almost all real estate acquisition activities, including acquiring rights-of-way. DATC's RFP process for real estate acquisition will include selection criteria such as availability of staff and experience in the local region of the Project. DATC's parent companies have strong experience with real estate project management and management of contractors for real estate acquisition work.

DATC's parent companies have successfully routed, permitted and acquired real estate for more than \$6 billion in new transmission infrastructure in the last 10 years – more than anyone in the industry. DATC understands the importance of proactive stakeholder outreach to support project development, and establishes strong relationships with landowners and residents, public officials, utility regulators and permitting agencies, natural resource agencies, environmental and conservation groups, customers and other interested members of the public early on. Relationships developed in the beginning stages of a project are fostered and maintained through construction and the life of the line.

The process for identifying routes for a new transmission line and/or sites for new substations is a sensitive one that involves significant information gathering and evaluation. DATC project teams work to identify and review sensitive environmental areas and land uses in project study areas. When evaluating a proposed transmission line route, DATC seeks input from local, state and federal officials, landowners and other interested parties. Working with the state-level conservation and natural resources offices helps to ensure that transmission projects are located in areas of least impact.

For large projects, when the time from a project's proposal to the beginning of construction can be five years or more, stakeholder outreach begins well before an application with authorizing agencies. DATC commits to maintaining open lines of communication and transparency in its routing and siting process and employs a variety of communications strategies such as face-to-face meetings with local elected officials and regulators, public open houses, direct mail, e-newsletters, and websites with interactive maps, videos, timelines, FAQs and other resources.

Cost Containment and Schedule Management

As mentioned previously, combined, DATC's parent companies have built more than \$6 billion in new transmission infrastructure in the last decade, delivering effective solutions at competitive costs. DATC projects accommodate challenging terrain and environmentally and culturally sensitive areas. DATC uses technologies that meet specific system needs without overbuilding or adding unnecessary cost.

DATC project managers focus on front-end-loaded scope development and management, schedule adherence, recovery plans (if necessary), cost and risk management through the use of Primavera schedules, internal processes and procedures, and employing internal and external functional support throughout a project. Additional information on Duke Energy and ATC's project management processes can be made available upon request.

DATC will implement a project management structure, employing practices to ensure the appropriate planning and execution of the project:

- A robust project controls infrastructure to track metrics tied to cost based on early indicators of cost overruns, such as productivity;
- Active monitoring of leading indicators of performance such as earned value metrics to proactively manage cost risk;
- Proactive management of contingency versus risks to ensure the project is carrying the appropriate amount of contingency;
- Focus on the contingency coverage ratio to ensure risks and remaining contingency are appropriately balanced;
- Early detection leading to appropriate corrective intervention as the basis of the risk management approach;
- Weekly schedule reviews, monthly execution reviews, and detailed quarterly reviews to actively manage project risks, looking for opportunities to identify new and further mitigate existing risk; and
- Project controls specialists with accountability for an integrated project schedule to ensure all work streams interact appropriately.

DATC plans to use a construction contractor for the Project. Although specific techniques for controlling costs and ensuring supplier performance will be negotiated and agreed upon at the time of contract execution, the following are techniques frequently used by DATC's supply chain team:

Cost Control

- Lump sum fixed price contracts or open book target price contracts with shared incentives for achieving or beating agreed upon targets
- Owner-supplied major equipment when and where cost effective
- Equipment and labor rate increases tied to specific independent indices for contracts exceeding 12 months in duration
- Stringent change order approval process
- Owner oversight of contractor activities including engineering, environmental health and safety, construction management and project controls and reporting
- Milestone payments based on completed and inspected work
- Invoices requiring detailed cost information for owner review and approval
- Joint management of project contingencies
- Right to audit all project costs
- Builder risk insurance

Ensuring Supplier Performance

- Performance bonds, letters of credit or parent company guarantees
- Liquidated damages if performance requirements are not achieved
- Delay liquidated damages
- Retention of 5% - 10% of all milestone payments until project completion and commissioning
- Strong warranty program
- “Make right” clause at contractor expense

Below is a listing of Duke Energy and ATC recently completed transmission line projects above 100 kV, which demonstrates a track record of building transmission on-schedule and on-budget.

Table 1: Recently Completed Duke Energy and ATC Transmission Projects

Project Description	Initial In-Service Date Final In-Service Date	Initial Budget Final Cost (Million USD)
<p>Rockdale-West Middleton New line serving multiple reliability functions as Dane County has some of the highest load growth in the state of Wisconsin. This line was needed to keep pace with the growing demand, and to strengthen the efficiency and reliability of existing lower voltage lines.</p>	<p>2013 Initial ISD 2/2013 Final ISD</p>	<p>\$145 Initial Budget \$140 Final Cost</p>
<p>Canal-Dunn Road New line provides significant voltage support and additional transformation capacity to the northern Door County, Wis. area.</p>	<p>6/2012 Initial ISD 6/2012 Final ISD</p>	<p>\$16 Initial Budget \$14 Final Cost</p>
<p>Cranberry-Conover-Iron River-Plains New line and voltage conversion of an existing circuit provide increase reliability by reinforcing a previously overloaded part of the system vulnerable to interruptions in Wisconsin.</p>	<p>5/2010 Initial ISD 3/2010 Final ISD</p>	<p>\$111 Initial Budget \$104 Final Cost</p>
<p>Fitchburg-Verona A new line that strengthens and maintains reliability in the rapidly growing areas of southern Dane County and northern Green County in Wisconsin.</p>	<p>12/2010 Initial ISD 6/2010 Final ISD</p>	<p>\$19 Initial Budget \$19 Final Cost</p>
<p>Paddock-Rockdale A new line that improves local utility access to the regional energy market. Economic benefits of the project are expected to more than pay for the cost of the project. This Wisconsin-Illinois line was the first access project approved within the MISO footprint.</p>	<p>2010 Initial ISD 3/2010 Final ISD</p>	<p>\$126 Initial Budget \$111 Final Cost</p>
<p>Gardner Park-Central Wisconsin-Morgan-Werner West New lines built to relieve congestion on facilities in and north of Green Bay, resulting in additional transfer capability and greater electric reliability for the area. In addition, this project provides capability for transmission service for a new power plant in the Wausau area.</p>	<p>12/2009 Initial ISD 12/2009 Final ISD</p>	<p>\$263 Initial Budget \$276 Final Cost</p>
<p>Jefferson County Reliability Project This project improved the ability to ensure continued electric service in the event of an outage on a portion of the network by creating an alternate path for electrical flow.</p>	<p>Summer 2009 Initial ISD 10/2009 Final ISD</p>	<p>\$32 Initial Budget \$30 Final Cost</p>
<p>North Madison-Huiskamp This new line is a reinforcement to the electric system in the area which was projected to be overloaded in summer 2009, resulting in increased vulnerability to outages for communities across northern Dane County.</p>	<p>Early 2009 Initial ISD 4/2009 Final ISD</p>	<p>\$19 Initial Budget \$17 Final Cost</p>
<p>Arpin-Rocky Run Structure Replacement A project to replace 20 miles of existing wood structures due to condition and</p>	<p>3/2010 Initial ISD</p>	<p>\$24 Initial Budget</p>

Project Submittal: DATC AP South Relief

Project Description	Initial In-Service Date Final In-Service Date	Initial Budget Final Cost (Million USD)
need to increase clearances. The wood structures were replaced with galvanized steel structures.	2/2010 Initial ISD	\$25 Final Cost
Arrowhead-Weston New 220-mile line to accommodate electric load growth in northern Wisconsin and improve reliability of the electric transmission system in the region. Honored with the 2009 EEI Edison Award recognizing ATC's work in completing this project ahead of schedule and within the approved budget.	5/2008 Initial ISD 1/2008 Final ISD	\$420 Initial Budget \$439 Final Cost
Pleasant Prairie-Zion Energy Center New line to relieve congestion and add a new interstate connection between Wisconsin and Illinois. Line also provides economic benefit to consumers by enhancing access to more efficient regional generation. Designated as a MISO Multi-Value Project for regional economic benefit.	2014 Initial ISD 12/2013 Final ISD	\$31 Initial Budget \$36 Final Cost
Kathleen - Zephyr Hills North Built to address significant load growth in Southern Pasco and Northern Hillsborough County.	12/2013 Initial ISD 9/2013 Final ISD	\$18 Initial Budget \$18 Final Cost
Intercession City - Gifford Built from source generation to address new western belt-way load pocket and relieve existing overloaded transformers.	12/2013 Initial ISD 7/2013 Final ISD	\$23 Initial Budget \$24 Final Cost
Hines - West Lake Wales Addition of a second circuit resolved regional congestion and improved power flow from nearby generation.	12/2011 Initial ISD 11/2011 Final ISD	\$11 Initial Budget \$11 Final Cost
Charlestown - CMC New expedited line to serve new industrial customer load.	3/2010 Initial ISD 3/2010 Final ISD	\$5 Initial Budget \$5 Final Cost
Qualitech-Pittsboro New expedited line to serve new industrial customer load.	9/2013 Initial ISD 9/2013 Final ISD	\$3 Initial Budget \$3 Final Cost
Lilesville - Rockingham New line to improve regional reliability and load growth.	4/2013 Initial ISD 4/2013 Final ISD	\$12 Initial Budget \$12 Final Cost
Warrenton Tap Additional line increases reliability and switching capability in rural part of system.	12/2013 Initial ISD 9/2013 Final ISD	\$6 Initial Budget \$6 Final Cost

Other Unique Qualifications

DATC will base its public outreach processes on the proven practices of parent company ATC. ATC utilizes an industry-leading inclusive public outreach process, involving the public in technical review of routing and siting options. Public feedback from open houses and other meetings is consolidated with technical expertise in transmission planning, engineering, environmental protection, construction, real estate and other internal disciplines to complete a comprehensive review of alternatives. ATC's approach is team-based and collaborative and has resulted in projects that achieve public acceptance and regulatory approval. Utilizing this approach, ATC has successfully obtained state regulatory approval for 65 projects totaling \$1.7 billion of transmission system improvements since 2001. Through strong collaboration with customers, ATC has also facilitated the interconnection of over 6,000 megawatts of generation to the transmission system in the same period of time.

Financing Plan

DATC is 50% owned by ATC and 50% owned by Duke Energy Transmission Holding Company, LLC (DETHCo). DETHCo is a wholly-owned subsidiary of Duke Energy Corporation. The following diagram illustrates the ownership interests of DATC:

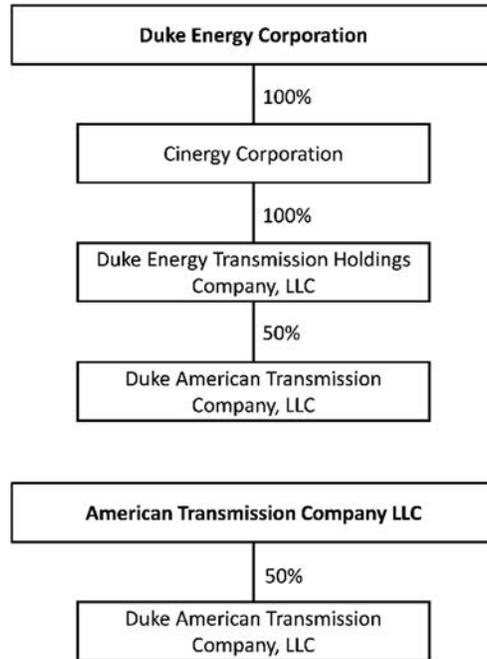


Figure 1: Ownership Interests of DATC

DATC is responsible for the financial aspects of this Project, and as demonstrated in the responses to this section, has complete financial capability to develop, execute and maintain the Project. As DATC is backed by Duke Energy and ATC, many of the responses include information about the parent entities to provide PJM with the most accurate sense of DATC's financial position.

DATC will finance 50% of the cost of the Project with debt, consistent with anticipated Federal Energy Regulatory Commission (FERC) ratemaking policy. DATC maintains discussions with commercial lenders about DATC's projects and has received strong interest on the projects. Based upon these conversations and the relationships of Duke Energy and ATC in the commercial lending market, DATC is confident that competitive debt financing can be obtained for the Project. DATC will make a final determination of the source and structure of the debt financing after being selected as the Designated Entity.

Both Duke Energy and ATC have a significant and successful history in financing projects, below is an illustration of projects financed by DATC’s parent entities.

Table 2: Sampling of projects financed by DATC’s parent entities

(1) Project Description	(2) Financing Structure	(3) Equity and Debt Contribution	(4) Debt Sources	(5) Banks Involved	(6) Capital Cost (Million USD)
Rockdale - West Middleton (Overhead, Steel Pole Construction)	Corporate	45.5% Equity and 54.5% Debt	Private Placement	Wells Fargo & US Bank	\$140
Gardner Park-Central Wisconsin-Morgan-Werner West” (Overhead, Steel Pole Construction)	Corporate	45.5% Equity and 54.5% Debt	Private Placement	Goldman Sachs, Wachovia and J.P. Morgan	\$276
Arrowhead-Weston (Overhead, Steel Pole Construction)	Corporate	45.5% Equity and 54.5% Debt	Private Placement	LaSalle & Lehman	\$439
Lilesville - Rockingham (Overhead Steel H-Frame)	Corporate	50% Equity and 50% Debt	A combination of revolving credit and bonds	A variety; top tier partners include, but are not limited to, Wells Fargo, BAML, Barclays, Citibank, JP Morgan, Credit Suisse, RBS and UBS	\$12
Hines - West Lake Wales (Overhead Steel Pole Construction)	Corporate	50% Equity and 50% Debt	A combination of revolving credit and bonds	A variety; top tier partners include, but are not limited to, Wells Fargo, BAML, Barclays, Citibank, JP Morgan, Credit Suisse, RBS and UBS	\$11

The remaining 50% of the cost of the Project will be funded by equity from DATC via Duke Energy and ATC equally. Upon selection as the Designated Entity, DATC will obtain guarantees for the equity funding necessary to construct the Project from the parent companies, if required. To illustrate the applicant's ability to procure capital, since inception, DATC has secured over \$71 million in equity capital for development and acquisition activities, including DATC's acquisition of Atlantic Power's economic interest in the Path 15 Upgrade in California in April 2013.

Both Duke Energy and ATC have strong credit ratings from Standard & Poor's and Moody's. DATC itself is not rated by a rating agency.

Standard & Poor's

Duke Energy: BBB+

ATC: A+

Moody's Investor Services

Duke Energy: A3

ATC: A1

Proposed Project Constructability Information

Project Components

[REDACTED]

Environmental

DATC can rely on its parent companies for environmental services. For example, ATC has a staff of 10 Environmental Project Managers each of whom has extensive experience and expertise in disciplines such as environmental impact study requirements, environmental permitting, and sediment and erosion control issues. While this staff does not have specific experience in the local area of the Project, ATC employs a “preferred vendor” approach by using multiple environmental consulting firms each of which has extensive experience nationwide, including the study area encompassing the Project. DATC would draw upon these and other resources to support any development efforts in PJM.

Land Acquisition

Upon being named the Designated Entity to build the Project, DATC will develop a project-specific real estate plan, which will include all relevant statutes and regulatory requirements for the state(s) involved. DATC understands that each state has unique characteristics, such as eminent domain statutes and permitting processes, and therefore it is essential to prioritize state or regional experience in selection of an acquisition contractor. With regard to public land, DATC has a strong program developed to consult with government agencies and to develop positive working relationships to address issues in a mutually beneficial manner. DATC has found that this approach facilitates easement negotiations.

Permitting

DATC will prepare thorough permitting plans that will begin with extensive outreach to key stakeholders (i.e. regulators, local officials, etc.) and will ultimately lead to securing all necessary permits in advance of construction of the projects.

Public Opposition

DATC currently is not aware of any public opposition to the Project. DATC anticipates that there will be public interest in the Project and will employ a sophisticated public outreach plan to inform the public of the Project early in the process and to share project information throughout the life of the Project. Tools used by DATC’s parent companies that could be used for public outreach for the Project include, but are not necessarily limited to, direct mail, open house events, project specific interactive websites, comment kiosks in impacted communities, and project related factsheets. As a reference, refer to www.datcllc.com or www.atc-projects.com to see what has been done on previous projects.

Project Costs

[REDACTED]

Total (in millions) \$34.91

[REDACTED]

Total (in millions) \$12.23

Project Schedule

[REDACTED]

Operating and Maintenance Plan

DATC is cognizant of the difficulties of remotely operating electric transmission system equipment. Data lag time and limited situational awareness of the surrounding area create reliability concerns, while operating remotely also increases exposure to data security issues. Maintenance of remotely located assets can also pose unique challenges.

With these issues in mind, DATC will create Operations and Maintenance agreements with locally established entities who are positioned to support these types of activities. Operations will be contracted to a local transmission operator; primary operation of the Project will therefore be performed from a local operating center. Maintenance agreements will cover the entire spectrum of maintenance activities required to ensure reliable continuous operation of the facilities. Depending on the particular circumstances, certain maintenance tasks may be bid out to other entities that specialize in particular type of work (ground line inspections, aerial patrols, maintenance of HVDC facilities, etc.). Also, depending upon the scope of the work, additional labor resources may be called upon to assist in completing maintenance projects. This is determined through communication with all affected entities.

In every case, DATC will rely on its parent companies to provide operations and maintenance specialists who will be assigned to oversee operation as well as the emergency and periodic maintenance of the equipment (both line and substation). These personnel collaborate with the required contracted entities to ensure successful completion of the required work, estimating resources needed, ensuring appropriate materials are available and providing budgetary oversight.

Maintenance Program

DATC's maintenance program will be modeled after that of its parent companies. For reference, ATC has a robust, effective formal preventive and predictive maintenance (PM) program for transmission line and substation equipment. The PM program is based upon industry best practices, industry research and ATC's own extensive experience. Also considered are equipment conditions, operating history, and environmental conditions. ATC's PM program uses several methods, dependent on equipment type, to determine when maintenance is required including: time-based, condition-based, and duty-based.

DATC intends to use a commercially available software/database called Cascade as its Maintenance Management System. All of DATC's substation and transmission line equipment will be listed as discreet components within Cascade, along with important manufacturer and equipment condition information. All preventative maintenance and corrective activities will be initiated and tracked in

Cascade. DATC's preventive maintenance activities will have procedures, performance checklists, and record-keeping abilities within Cascade. When preventive maintenance is due, it will be "triggered" in Cascade and the activity assigned to an individual. The assigned individual will utilize the applicable Cascade procedure/checklist while performing preventive maintenance to document the activities performed and equipment condition in Cascade. Any declining or unsatisfactory equipment conditions are flagged for follow-up, and depending on condition may result in a corrective work order. All corrective work orders will be reviewed and prioritized by DATC staff on a priority based 1-to-4 scale. The corrective work is scheduled consistent with the priority and other factors such as planned outage capability and resource availability.

DATC will follow ATC's model to have an overall PM program document that covers its entire PM program including types of preventive maintenance and periodicities. The ATC model also has detailed procedures that direct the actual performance of preventive maintenance activities for all major equipment. Listed below are some of the more significant PM activities conducted for:

Substations:

- Power Transformers: periodic oil analysis (6 months or 12 months), electric tests (5 years)
- Instrument transformers: Performance verified during relay testing
- Breakers and Circuit Switchers: Annual winterization, periodic diagnostic testing and major internal inspections, both intervals are based on various parameters
- Station Batteries and chargers: annual testing, monthly/bimonthly inspections
- Relays: varies by relay type (monitored or unmonitored)
- Substation inspections: interval varies with the type of equipment contained in the substation
- Safety and security related equipment: as required by equipment type
- Continuous monitoring of most substation equipment is available through EMS. This information is one input used to determine the need for maintenance.

Transmission lines:

- Equipment aerial patrols normally twice per year plus a summer vegetation aerial patrol annually
- Equipment inspection (ground patrols): every 3 or 4 years depending on construction type, age, priority and historical findings
- Wood pole ground line inspection and treatment: 10-year cycle based on treatment product effective life (generally beginning once a pole is 20 years old)
- Aerial infrared line inspection to identify hotspots on lines that require repair due to conductor damage or splice degradation

- Transmission line guy anchor inspections of below grade condition
- Directly buried steel structure below grade condition inspections
- Underground transmission line monitoring and inspections – various
- Unplanned aerial and/or ground patrols to investigate causes of forced outages or other unplanned events
- Right-of-way vegetation management activities on a nominal five-year cycle, depending length of growing season and tree growth factors

ATC has a series of metrics that are used to monitor the performance of its maintenance programs, including status of preventive and corrective work. These metrics are published monthly and distributed to responsible staff and management for follow-up.

Unfamiliar or Unique or Atypical Equipment:

As DATC encounters equipment that is specialized or simply of a design that is unfamiliar to its subject matter experts, DATC will engage the appropriate resources at the required level to assist in building needed maintenance schedules, procedures and intervals. Factory-provided SMEs will be utilized at all times until local or in-house expertise is established.

Spare Materials

DATC's parent companies presently stock spare parts for routine maintenance of substation equipment at various locations. Equipment on hand includes spare circuit breakers, disconnect switches, instrument transformers, and power transformers at substations and storage locations. ATC participates in the EEI STEP in the 345/138-kV class for power transformers and is a participant in the NERC Spare Equipment Database.

DATC's parent companies also stock various wood poles, steel poles, towers, insulators, many various conductor types/sizes and significant hardware items to respond to system disturbances. Emergency inventory products and quantities are regularly reviewed to ensure adequate inventory to respond to system emergencies.

Forced Outage Response

DATC will follow the lead of its parent companies regarding forced outage response. For example, ATC has a very robust forced outage response program as evidenced by its industry performance. In the most recent benchmarking study based on 2012 data, ATC ranked in the top 10 percent of its peer group for reliability performance. In addition, ATC reduced the number of overall unplanned outages on its system by 17% over its last three year average. The improved performance can be attributed to monitoring leading failure indicators and targeted maintenance and equipment replacement programs. ATC reviews every forced outage that occurs on its system to identify the cause, correct that cause, and implement measures to prevent recurrence where possible. ATC conducts a weekly management-level conference call to review each of these outages and discuss corrective actions.

DATC will have policies, procedures and guidelines that define and dictate forced outage response, including line patrol requirements (planned and unplanned), equipment testing and diagnostic requirements (planned and unplanned), major equipment fault analysis and troubleshooting, and processes for emergency clearance and coordination with other entities, including generation, distribution and transmission. System Protection specialists will review every auto-operation associated with an outage to ensure equipment operated correctly and as designed. The System Protection Engineer will remotely access the event recording devices associated with the affected high voltage equipment, and download the associated events for all relays that should have operated for the event to support a root cause analysis. All event determinations will be fully documented, including any needed corrective action plans.

For new protective systems, updates to existing protective systems, or emergent coordination concerns, protective system coordination with other entities will follow established detailed procedures of DATC's parent companies to document the communication and relevant technical data. This process will be fully compliant with NERC PRC-001.

Other Assumptions

[REDACTED]

Project Planning Analysis

Project Description

[REDACTED]

Planning Analysis

[REDACTED]

Power Flow and Dynamics Modeling

[REDACTED]

Economic Simulation Modeling

[REDACTED]

Appendix A –Planning Analysis Details

Project One-Line Diagrams

[REDACTED]

Equipment Parameters and Assumptions

[REDACTED]

Planning Analysis Results

Congestion cost is significantly reduced on the targeted element with the Project. The tables below show the congested elements savings for both Annual Congestion Cost and also Constrained Hours in the 2019 case.

Table A1: 2019 Congestion Cost Reduction

Constraint Name	Base	AP South Relief	AP South Relief Savings
AEP-DOM L/O BED-BLA FLO 01BEDNGT 500-01BLACKO 500	\$109,806,484	\$80,610,675	\$29,195,808

Table A2: 2019 Constrained Hours Reduction

Constraint Name	Base	AP South Relief	AP South Relief Savings
AEP-DOM L/O BED-BLA FLO 01BEDNGT 500-01BLACKO 500	1,799	1,453	346

DATC has shown the Benefit-To-Cost Ratio is approximately 3.9 using all four PJM PROMOD model study years and PJM’s provided spreadsheets. A quick look at the overall savings is shown below.

Table A3: Benefit-to-Cost Performance

Project Benefit/Cost Results – DATC AP South Relief Project			
Regional Method	<u>NLP</u>	<u>APC</u>	
Benefits	\$430.8	\$103.4	Millions
Factor	50.0%	50.0%	%
Total Benefits	\$267.1 Millions		
B/C Ratio	3.89	PASS	

Schedule and Cost Assumptions

[REDACTED]

Sensitivity Analysis Results

[REDACTED]

Appendix B: CPCN and Permitting Process – Maryland

Does the state have an approval process for new transmission lines, and if so what? Yes, if the transmission line is capable of operating above 69 kV, the state of Maryland requires the utility to obtain a Certificate of Public Convenience and Necessity (CPCN).

Is there a required timeframe for the decision, from application to final order, and if so what? No, there is no required timeframe for the CPCN process except for a 30-day time limit on appealing a decision by the Maryland Public Service Commission (MPSC).

What information is required? For a CPCN, the following information is required: a description of the location and construction, property rights to be acquired, alternative routes (if project is not a modification of existing lines), identification of any ROW requiring construction in a 100-year flood plain, topographical maps, a statement of need, a description of the economic impact, a statement on the cost effectiveness of the project, an environmental impact study, and an implementation schedule.

Does the state have a statute analogous to NEPA that requires an Environmental Impact Statement? Yes, the CPCN admin. reg. (COMAR 20.79.04.04) requires an environmental impact statement that is similar to NEPA.

What process, if any, applies to substation-only projects? There is no process that applies to substation-only projects.

Appendix C: CPCN and Permitting Timeline – Maryland

Table C1: CPCN Permitting - MD

Obtain a Certificate of Public Convenience and Necessity			
<p>NOTE: This is needed for any electric transmission line construction or modification of 69 kV or more. COMAR 20.79.01.02, COMAR 20.79.01.04.</p> <p>NOTE: The CPCN requirement will be waived if the construction does not require obtaining new property or ROWs and does not require larger or higher structures to accommodate increased voltage or higher conductors. Md. Public Utilities Code Ann. §7-207.</p>			
Timeline	Task	Authority	Est. Duration
Prior to submitting CPCN application	Prepare application, to include environmental impacts.		365 days
CPCN submission date	Submit the CPCN, which requires a description of the location and construction, a statement of need, a description of the economic impact of the project, an environmental impact statement, and certain other details.	COMAR 20.79.01.04; COMAR 20.79.04.01-.04.	335 days
For 4 weeks prior to public hearings	The MPSC will provide weekly notice of the hearing in each county affected.	Md. Public Utilities Code Ann. §7-207	30 days
Hearing dates	The MPSC will hold public hearings.	Md. Public Utilities Code Ann. §7-207	45 days
Decision date	The MPSC will render a decision on the CPCN.	Md. Public Utilities Code Ann. §3-115	30 days
Within 30 days after decision date	An applicant may apply for a rehearing or an appeal.	Md. Public Utilities Code Ann. §3-113;§3-114	30 days
Within 30 days after a rehearing is granted	The MPSC will render a decision on the rehearing.	Md. Public Utilities Code Ann. §3-114	30 days

Appendix D: CPCN and Permitting Process – Pennsylvania

Does the state have an approval process for new transmission lines, and if so what? Yes, if the transmission line is capable of operating above 120 kV, the state of Pennsylvania requires the utility to obtain approval of the siting application from the Pennsylvania Public Utility Commission (PUC). For a line operating over 120 kV that will be located entirely within a public road, will be located entirely on an existing right-of-way (ROW), or is 2 miles or less in length, a letter of notification may be filed in lieu of the siting application process.

Is there a required timeframe for the decision, from application to final order, and if so what? No, for the siting application there is no required timeframe except for the public must be notified of the hearings 45 days prior to the commencement of hearings and the utility has 15 days to appeal the PUC decision.

There are no required timeframes for the letter of notification in lieu of application.

What information is required? For a siting application, the following information is required: a description of the location and construction; a statement of safety considerations; a statement of need; project plans and specifications; maps; reasonable alternative routes; the names of owners of proposed ROWs; financial details for construction and operation; an environmental impact study description; a description of archaeological, geologic, historic, and scenic areas of significance; and a projected date of completion.

For a letter in lieu of application, the following information is required: a description of the location and construction, a statement of safety considerations, a statement of need; proposed in-service date; and evidence to show that the line will not substantially alter the ROW.

Does the state have a statute analogous to NEPA that requires an Environmental Impact Statement? Yes, the siting application admin. reg. (52 Pa. Code §57.72) requires an environmental impact statement that is similar to NEPA.

What process, if any, applies to substation-only projects? There is no process that applies to substation-only projects.

Appendix E: CPCN and Permitting Timeline – Pennsylvania

Table E1: CPCN Permitting - PA

Obtain approval of the siting application			
NOTE: Approval of the siting application is needed only for transmission lines with a design voltage greater than 120 kV. 52 Pa. Code §§57.1-57.2.			
Timeline	Task	Authority	Est. Duration
Prior to submitting the siting application	Prepare siting application. Prepare eminent domain authority application.	52 Pa. Code § 57.72; 52 Pa. Code §69.3103	365 days
Siting application submission date	Submit the siting application, which requires an environmental impact statement, the names of owners of the proposed ROW, the design and construction plans, estimated costs, and certain other details.	52 Pa. Code § 57.72; 52 Pa. Code § 69.3105-07.	
Hearing date selected	Upon the filing of a siting application, the PUC will set a time and place for the hearings.	52 Pa. Code §57.75	320 days
At least 45 days before the date set for the hearings	The utility must commence publishing 2 consecutive weeks of notice of hearings in a newspaper of general circulation within each municipality where the project is proposed to be built.	52 Pa. Code §57.75	45 days
Hearing dates	Hearings in progress.		45 days
Decision date	The PUC will render a decision on the siting application.	52 Pa. Code §57.76; 66	30 days
Within 15 days of decision date	Petitions for rehearing or an appeal must be filed within 15 days.	52 Pa. Code. §5.572; 52 Pa. Code §5.536	15 days