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JOINT APPLICATION OF THE CITY OF SAN ANTONIO, ACTING BY AND THROUGH THE CITY PUBLIC SERVICE BOARD (CPS ENERGY), AND SOUTH TEXAS ELECTRIC COOPERATIVE, INC. (STEC) TO AMEND THEIR CERTIFICATES OF CONVENIENCE AND NECESSITY FOR THE PROPOSED HOWARD ROAD-TO-SAN MIGUEL 345 KV TRANSMISSION LINE IN BEXAR AND ATASCOSA COUNTIES	§ § § § § § § § § § §	**PUBLIC UTILITY COMMISSION** **OF TEXAS**

DIRECT TESTIMONY

OF

ETHAN J. FHOLER, P.E.

ON BEHALF OF

SOUTH TEXAS ELECTRIC COOPERATIVE, INC.

October 4, 2024

PUC DOCKET NO. 57115

DIRECT TESTIMONY OF ETHAN J. FHOLER, P.E.

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PUBLIC UTILITY COMMISSION OF TEXAS

DIRECT TESTIMONY OF
ETHAN J. FHOLER, P.E.

I.

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Ethan J. Fholer. My business address is 16825 Northchase Drive, Suite 1200, Houston, Texas 77060.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by POWER Engineers, Inc. (POWER) as a Department Manager and Senior Project Engineer in the Transmission Line Business Unit within the Power Delivery Division. POWER is a multi-discipline consulting firm that provides engineering, construction, and project management services.

Q. PLEASE DESCRIBE YOUR JOB RESPONSIBILITIES, PARTICULARLY AS THEY RELATE TO THIS PROCEEDING.

A. I manage POWER's Overhead Transmission Line departments in both Austin and Houston. I am also a senior project engineer responsible for leading teams of engineers in the execution of transmission line design projects. These projects range in voltage from 69 kV to 500 kV. I will be responsible for managing the engineering design team for STEC's portion of the Howard Road to San Miguel 345 kV

transmission line project in Bexar and Atascosa counties (Project), which is proposed jointly by STEC and CPS Energy.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL/PROFESSIONAL QUALIFICATIONS AND BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science in Civil Engineering from Texas A&M University in May 2012. I have been a registered Professional Engineer in Texas since December 8,2016 (License No. 124939). I started at POWER full-time in June 2012 and have approximately 12 years of experience in the transmission industry. From 2012 to 2015 I worked as a transmission line design engineer supporting a wide range of projects. My primary responsibility during this time was to assist project engineers in the design of overhead transmission lines. These responsibilities included structural and foundation design, line modeling, design and construction drawing development, and permitting. In May 2015, I went to work for Dashiell Corporation in their overhead transmission group. Similar to my previous role at POWER, I was tasked with providing engineering support for transmission line and distribution projects ranging from 12.5 kV to 500 kV. In July 2016, I returned to POWER as a project engineer in the overhead transmission business unit. During this time, I was tasked with leading design teams, quality review, and the training of engineering personnel. In 2020, I became the manager for our overhead transmission department in Austin. In addition to continuing to lead transmission projects, I managed the department's finances, developed department specific business plans, and guided various design teams. I have experience with traditional

transmission design projects as well as EPC projects. I have also functioned in an Owner's Engineer role for various utilities. Over my career, I have had the opportunity to work as a design engineer on 11 greenfield 138 kV and 345 kV projects that involved the Public Utility Commission of Texas (PUCT). For each of these projects, I carried out the project design in accordance with the Final Order from PUCT in collaboration with my clients, often as the Engineer of Record. I have worked on several 345 kV projects in the State of Texas, including multiple active 345 kV design projects.

Q. HAVE YOU PREVIOUSLY PERFORMED WORK RELATED TO TRANSMISSION LINE ADMINISTRATIVE PROCEEDINGS?

A. Yes. I have supported project estimates, and route and structure selection analysis for other engineers for transmission line projects in administrative proceedings. These include Docket 44649 for Cross Texas Transmission and Docket 49532 for LCRA TSC.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY TO THE PUCT?

A. No. I have not previously submitted testimony to the PUCT.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of STEC. POWER was retained to provide engineering services and support for STEC's portion of the Project. My testimony provides some of the technical and engineering elements of STEC's portion of the

Application that is being filed jointly by STEC and CPS Energy (the Joint Applicants).

II.

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe the design and cost components of STEC's portion of the Project, including:

1) the design of the proposed structures;
2) the initial structure type study;
3) engineering considerations for the proposed structures;
4) estimated costs of the proposed routes.

Q. WHAT PORTIONS OF THE APPLICATION DO YOU SPONSOR?

A. I am co-sponsoring STEC's response to questions 5, 6, 8, and STEC's transmission facilities estimate for question 13.

Q. IN ADDITION TO SPONSORING PORTIONS OF THE APPLICATION, DID YOU PROVIDE ANY INFORMATION FOR THE PROJECT'S ENVIRONMENTAL ASSESSMENT?

A. Yes. I supplied information for Figures 1-4 and 1-5 of the *Howard Road to San Miguel 345 kV Transmission Line Project Environmental Assessment and*

Alternative Route Analysis in Atascosa and Bexar Counties, Texas (Environmental Assessment or EA), which is Attachment No. 1 to the Application.

Q. WERE YOUR TESTIMONY AND THE INFORMATION YOU'VE IDENTIFIED AS SPONSORING PREPARED BY YOU OR BY KNOWLEDGEABLE PERSONS UPON WHOSE EXPERTISE, JUDGMENT AND OPINIONS YOU RELY IN PERFORMING YOUR DUTIES?

A. Yes.

Q. IS THE INFORMATION CONTAINED IN YOUR TESTIMONY AND THAT YOU ARE SPONSORING TRUE AND CORRECT TO THE BEST OF YOUR KNOWLEDGE AND BELIEF?

A. Yes.

III.

DESCRIPTION OF THE PROJECT

Q. PLEASE DESCRIBE THE PROPOSED TRANSMISSION LINE PROJECT.

A. The Joint Applicants are proposing to build and operate a new 345-kV double circuit transmission line in South Texas, installing both circuits at the time of initial construction. CPS Energy will own the northern half and STEC will own the southern half of the new transmission line. Each utility will be responsible for its

respective portions of the Project, including design, right-of-way (ROW) acquisition, material procurement, construction, and any necessary permitting for its half of the Project. The ownership change point of the Project will be determined based upon the approval of the PUCT of the final transmission line route. The new transmission line will connect CPS Energy's Howard Road Station located approximately 3 miles northeast of the intersection of State Highway (SH) 16 and SH 1604 to STEC's existing San Miguel Station located approximately four miles east of SH 16 and approximately 0.65 mile southwest of Farm-to-Market Road (FM) 3387. The proposed transmission line structure type is steel monopole structures. The planned conductor type is two bundled (2) 1272 kcmil ACSS/TW "Pheasant". The ROW width will be 150 feet and the structure height range is from 120 to 150 feet. The transmission line will be designed for two overhead shield wires. The geometry of STEC's typical structures is provided in Figures 1-4 and 1-5 of the EA.

If ordered otherwise by the PUCT, or in constrained areas such as, but not limited to, transmission line crossings, pipeline crossings, and in proximity to airports or heliports, STEC could use shorter than typical, taller than typical, or alternative structure types, and may need a wider-than-typical ROW width.

Q. WILL THE TRANSMISSION LINE DESIGN FOR THE TRANSMISSION PROJECT MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL SAFETY CODE?

A. Yes. The design for the Project will meet or exceed the safety requirements for construction as defined in the National Electrical Safety Code (NESC). Because the NESC is a safety code, not a design guide or criteria, additional design criteria will be used. The additional criteria will incorporate American National Standards Institute (ANSI) standards, OSHA standards, STEC standard practices, and such practices as required by federal, state, and local governments and agencies.

Q. WHAT IS THE MINIMUM ROW WIDTH NEEDED AND HOW WAS THAT DETERMINED?

A. The Project will be constructed in new ROW, within easements typically 150 feet in width, using spans that typically range from approximately 800 to 1,200 feet. The ROW requirements were determined in part, by calculating the conductor blowout clearances to the edge of the ROW for various design conditions. The conditions considered were (i) 0 pounds per square foot ("psf") wind (0 mph), maintain NESC required horizontal clearance to a building at the edge of the ROW with a three-foot buffer, (ii) under a 6-psf wind (49-mph) wind, maintain NESC required horizontal clearance to a building at the edge of the ROW with a three-foot buffer, and (iii) under a 25.6-psf wind (100-mph) wind, maintain the conductor blowout envelope within the easement boundary with a two and a half foot buffer. In some areas, easement width and span length could be more or less than typical depending on terrain and other engineering considerations. Access easements and/or temporary construction easements may also be needed. Possible areas where

a greater minimum ROW may be needed are discussed in the Direct Testimony of Mr. Paul Person, filed with the Application.

Q. DESCRIBE THE STRUCTURE FAMILIES USED IN THE COST ANALYSIS?

A. The structure family used in the cost analysis consists of 345 kV double circuit steel monopoles for typical tangent, angle, and dead-end structures. Tangent and Small Angle (1° - 5°) structures are single poles utilizing direct embed foundations with concrete backfill. Larger Angle (5° - 30°) and Dead-end structures are two pole structures utilizing concrete drilled pier foundations. Figures 1-4 and 1-5 of the EA represents the general geometry for the typical tangent and dead-end structures that were utilized in the provided cost estimates.

Q. WHAT WERE THE OTHER FACTORS CONSIDERED BY STEC THAT INFLUENCED ITS STRUCTURE SELECTION?

A. In the structure study, STEC considered tubular steel structures and steel lattice towers. Several factors were considered during the structure selection process, including cost, project schedule, material lead times, engineering constraints, and aesthetics. Though the installed cost of the two different structures is comparable, factors outside of structure type are more likely to influence cost deviation between actual and estimated. The geographical location of this joint venture with CPS Energy through the southwest outskirts of San Antonio traverses significantly more congested land uses. The smaller monopole footprint allows routes to more closely

follow property line and boundaries of public roads than the larger footprint of lattice structures. Impacts to land uses by the larger footprint of lattice tower can be materially higher than impact by monopoles. The smaller footprint of monopoles is helpful in avoiding constraints such as roads and subsurface utilities, and they have a narrower visual profile, and for that reason, are often preferred by the public over lattice towers. Considering all factors the Applicants chose monopoles as the more suitable structure type alternative for this Project's requirements.

Q. DOES THE PROPOSED TRANSMISSION LINE ADEQUATELY CONSIDER ELECTRICAL EFFICIENCY AND RELIABILITY?

A. Yes, the proposed transmission line adequately considers electrical efficiency and reliability. A line constructed on any of the alternative routes will be engineered so that the line itself will be electrically efficient and reliable. Some route characteristics, such as line length and number of angle structures, will make lines located on some alternative routes less cost efficient than others. However, any of the alternative routes studied can be engineered so that electrical efficiency and reliability will be adequate.

IV.

DESCRIPTION OF COST ESTIMATES

Q. THE APPLICATION CONTAINS ESTIMATED TOTAL INSTALLED COSTS FOR EACH IDENTIFIED ROUTE BEING CONSTRUCTED WITH

STEEL POLES. DID POWER ASSIST STEC WITH THE PREPARATION OF COST ESTIMATES.

A. Yes, POWER prepared estimates for construction and material costs for STEC's portion of the Project. These construction and material cost estimates were supplied to STEC and form the basis of the total estimated costs for STEC's portion of the Project, as described in Attachment No. 2 of the Application. The total estimated costs for STEC's portion of the Project are further described in the direct testimony of Mr. Person.

Q. PLEASE DISCUSS THE CONSTRUCTION AND MATERIAL COST ESTIMATES PREPARED BY POWER IN MORE DETAIL.

A. Transmission line cost estimates include costs for materials (structures, insulators, conductor, hardware, and foundations), ROW labor and easement acquisitions, construction labor, engineering labor, surveying, and overheads. A brief discussion of these costs follows:

ROW

Estimates for the ROW acquisition were provided by STEC and are based upon a review of recent property sales prices in the area and the costs incurred in acquisition based upon past projects.

MATERIALS

Estimates for materials are based upon recent costs received from suppliers, the completion costs of past similar projects, and estimated numbers and sizes of tangent and angle structures that would be needed for STEC's portion of the Project. Material units include structures, wire, insulators, hardware, and other items that must be procured for the project. Estimates of the material costs assume the proposed transmission line would be constructed using monopole structures.

LABOR

Estimates of labor cost for STEC's portion of the Project include contract labor for the line construction based upon past similar projects. Typical construction labor items include ROW clearing and preparation, installation of gates, culverts and environmental controls, foundation installation, structure assembly and installation, and the stringing and sagging of wires, conductor, and related hardware. The labor cost estimate also includes projected construction management and inspection costs. The cost estimate for ROW clearing is included in the labor (contract) amount and is based upon historical prices from ROW clearing contractors.

ENGINEERING

Transmission line engineering costs, for both STEC and contracted engineering services are based upon costs for engineering on past similar projects. The contract engineering cost estimate includes surveying, soil analysis, foundation design, line design, contract owner's engineering services, alternative routing analysis, and structure selection study.

Q. DO YOU BELIEVE ALL OF THE ESTIMATED COSTS DISCUSSED ABOVE TO BE REASONABLE?

A. Yes, I believe the cost estimates prepared by POWER are reasonable based on my experience with projects that have required similar construction activities and current market conditions. The cost estimates were developed using a consistent, nonbiased process, and provide the Commission a reasonable basis to compare project alternatives.

V.

CONSTRUCTION ACTIVITIES

Q. PLEASE DESCRIBE THE TYPES OF CONSTRUCTION ACTIVITIES THAT WILL BE ASSOCIATED WITH THE CONSTRUCTION OF THE PROPOSED LINE.

A. The following construction activities will take place during construction of the proposed lines: surveying, ROW clearing, material hauling, foundation installation, structure framing, structure erection, conductor and shield wire installation and ROW cleanup. Additional information on ROW clearing, construction, and ROW cleanup are provided in Section 1.4 of the EA.

VI.

SUMMARY AND CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Based upon the information that I have provided or reviewed, STEC has proposed to construct their portion of the transmission line in a safe and efficient manner. The proposed line will be designed in accordance with STEC's design criteria, which meets or exceeds the NESC. The structure cost analysis by POWER provides STEC the necessary information to decide the appropriate structure design to use for this Project. STEC's selection of the tubular steel structures design for this Project was the best choice as supported in this testimony. The estimated costs to construct the transmission line were developed using a consistent, nonbiased process, and provide a reasonable basis to compare the route alternatives. Upon start of construction, the line is expected to be completed in a timely manner, absent any significant weather delays or other delay drivers beyond STEC's control.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.