



# POWER DELIVERY STATEMENT OF QUALIFICATIONS

[www.RRCcompanies.com](http://www.RRCcompanies.com)

**RRC**  
experience matters

At the heart of a successful project lies a team of experts who can convert their knowledge to project results. Our successful business model starts with listening to our clients' objectives and applying our experience to develop a project approach that optimizes value. We provide solutions our clients can trust, added value through our innovative abilities, and exceptional service. With project experience and a value engineering approach, we provide economical solutions to complex problems. Our engineers, scientists, and surveyors are among the most experienced in their fields.

We believe that **experience matters**. It's more than a tag line. It's how we define ourselves.

# SOLUTIONS YOU CAN TRUST



## **Integrity**

We conduct our business honestly and ethically. We take responsibility for both our words and actions and provide solutions our clients can trust.

## **Exceed Client Expectations**

We exceed our clients' expectations with our exceptional service. We strive to be our clients' first choice for the industries we serve by delivering more value than they expected.

# VALUES DEFINE A COMPANY

## **Accountability**

We expect high standards from our services and our people. We commit to consistently improve the services we provide and we are accountable for the quality of those services.

## **Innovation & Continuous Improvement**

As the industry evolves and advances, we maintain an innovative perspective and seek to continuously improve and incorporate the latest industry advancements. We are constantly expanding our expertise.

## **Employee Development**

We understand that exceeding our clients' expectations can only be achieved with great people. We invest in professional development of our team and work hard to retain and recruit top talent.

## **Positive Attitude & Teamwork**

A company benefits most from a collaborative work environment. We recognize that a positive work environment includes one that promotes safety and allows for a healthy work-life balance.



# MARKETS

POWER DELIVERY

WIND POWER

SOLAR POWER

OIL & GAS

# SERVICES

CIVIL ENGINEERING

CONSTRUCTION MATERIALS TESTING

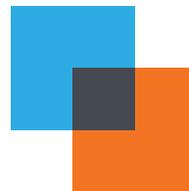
ELECTRICAL ENGINEERING

GEOTECHNICAL ENGINEERING

LABORATORY SERVICES

LAND SURVEYING

STRUCTURAL ENGINEERING



Our team of professionals and support staff has the multi-disciplinary capability to take on a wide variety of projects serving the utility, industrial, municipal, and commercial sectors. From strategic planning and conceptual design to project management and construction testing, we get the job done.

By hiring key experienced staff and following the same founding principal of delivering value, we continue to grow and diversify our services to support the evolving industry.

Our **vision** is to be the recognized leader of value-added technical services for the energy industry as defined by the successes of our clients and our people.

# power DELIVERY

RRC provides engineering and consulting services for transmission and substation projects throughout the United States for all types of facilities. We have the experience and expertise to plan and design all aspects of the project to enhance reliability and deliver high performance. Our client-focused company culture means we are proactive in identifying and solving challenges and meeting tight deadlines. We provide support around the clock and quick responses. We recognize the industry's constant evolution in safety, reliability, and smart grid technologies, and are an integral part of vetting new options and replacing aging infrastructure. Our comprehensive, multi-discipline approach to a project means minimal coordination and management for the client which allows our clients to run more efficiently.

Services provided for Power Delivery projects include:

- Electrical Substation Design (4 kV-500 kV)
  - Calculation and Drawing Packages
  - Distribution, Transmission, and Industrial Substations
  - Equipment Specifications
    - Power Transformers
    - Distribution Transformers
    - Breakers
    - Capacitor Banks
    - Switchgear
    - Control Houses
    - Other Major Equipment
  - Protection and Control Design Studies
    - Coordination Studies
    - Grounding
    - Lightning Protection
    - Reactive Power Analysis
    - Load Flow
    - Short Circuit
    - Ampacity
    - Arc Flash Hazard Analysis
    - Substation Calculations such as Voltage Drop, Conduit Fill, AC and DC Sizing
  - Substation SCADA Engineering
  - Substation Automation
- Distribution, Subtransmission, and Transmission Line Design (15 kV to 345 kV)
- Geotechnical Investigation, Testing, and Engineering
- Structural and Foundation Design Services, and Optimization
- Civil Engineering, Stormwater Pollution Prevention Plans (SWPPP), Grading, and Drainage Studies
- Electrical Engineering Studies including Asset Protection Analysis
- Underground Power Cable Engineering
  - Cable System Reliability Consulting
  - Power Cable Testing and Diagnostics
  - Commissioning and Field Testing
  - Aged Cable Analysis
  - Power Cable Ampacity Calculations
  - Temperature Monitoring Systems
  - Electromagnetic Field (EMF) Analysis
  - System Grounding/Bonding
  - Cable and Accessories Specifications
  - Installation Design
  - Cable System Comparisons and Estimations
- Construction Material Testing and Onsite Quality Assurance/Quality Control
- Site Surveying including Boundary and Right-of-Way Surveys



## 220 MVA BEARKAT I WIND COLLECTION, SUBSTATION & TRANSMISSION PROJECT

- Location: Garden City, Texas
- Installed Capacity: 196.65 MW
- Year Commissioned: 2017

The Bearkat I Wind Project involved the design of a 34.5 kV collection system, the associated 220 MVA, 345 kV – 34.5 kV collection substation, and an interconnecting 345 kV transmission line terminating at the utility substation (point of interconnection - POI). The substation components included an EHV circuit breaker, power transformer, neutral grounding reactor, main breaker, collection circuit breakers, reactive circuit breaker, and switchers for the cap bank and reactor. RRC performed foundation and oil containment designs. Steel fabricators provided the substation and transmission structural design, both of which were overseen by RRC as this design capability is a hallmark of the company. Specifications for major equipment were written and presented by RRC for purchase by the client, followed by reviews and recommendations by RRC. The design produced was utility grade, professionally preformed and produced, and included a full complement of design deliverables.

The design required the performance of considerable studies in order to verify the integrity and safety of the project. Requirements included those of the Utility (WETT), the Turbine System Supplier (Vestas), ERCOT, OSHA, FERC, NERC, and National and Local codes, specifications and standards. Studies that were performed to verify that all requirements were met included AC Loss, Arc Flash, Cable Ampacity, Bus Calculations, EMF, Grounding, Lightning Shielding, Harmonic Analysis, Illumination, Insulation Coordination, System Protection, Reactive Power and Short Circuit.

The protection system design was comprehensive and included line differential relays, transformer and bus differential relays, overcurrent and undervoltage, RAS, metering etc. An especially challenging task involved considerable interaction with Vestas, WETT, ERCOT, the Client, and the Owner's Engineer in an effort to ensure that voltage and power factor at the POI met minimum acceptable levels for all possible operational scenarios. This involved sophisticated protection schemes located at the substation that relied on SCADA signals being received over fiber coming from both the Utility and Vestas systems. The protection system included a Remedial Action Scheme (RAS) for emergency isolation of the Vestas turbines in the event of specific system operating conditions (FERC requirement).

Reactive response, for meeting the POI voltage and power factor requirements involved the design of Cap Banks and a Reactor on the medium voltage side of the substation with switchers that responded to protection system commands.

Deliverables for each of these design packages involved all physical and electrical design drawings, specifications for the purchase of equipment and systems, bills of material, studies and other documentation. These provided the necessary documentation and design drawings for construction of the facility from the wind turbine generator step up transformers, through the substation, and on to the POI at the electric utility.

## **BIRDS OF PREY SUBSTATION**

- Location: Reeves County, Texas

RRC provided land surveying, civil engineering, and geotechnical engineering services for this vital project. RRC performed a topographic survey of the proposed substation site and the grounding analysis, developed overall site grading and drainage plans, excavation and fill notes, site access plan, and construction and testing requirements. RRC also performed the grounding analysis and design and provided the arc flash study for the project. The geotechnical department performed earth Electrical Resistivity (ER) testing.

## **1.34 MWDC SOLAR AND BATTERY STORAGE PILOT PLANT**

- Location: New Orleans, Louisiana

This project is a new photovoltaic generating facility located in New Orleans, Louisiana. A 0.5 MWAC Battery Energy Storage System (BESS) is co-located, and for maximum flexibility, is capable of charging from the grid or the PV system. The BESS is configured to provide energy storage as well as voltage support to the grid. The facility is directly tied to the Utility's distribution and central control system. RRC provided the land surveying, civil engineering, structural engineering, geotechnical engineering, electrical engineering, SCADA design and hardware engineering services, permitting support, project management and as-built drawings for the project.

## **36 MW SUBSTATION**

- Location: St. Elizabeth Parish, Jamaica
- Capacity: 36 MWAC
- Year Commissioned: 2016

This project consisted of 11 - 3.3 MW wind turbines on two 34.5 kV feeder circuits. The collector system connected to a SF6 insulated switchgear in the substation and then stepped up to 69 kV for transmission on the Jamaican grid. RRC was brought in after construction started to review and re-design various areas of the substation that did not meet contract requirements. Because RRC's involvement began so late in the project, a tight schedule had to be met while coordinating and communicating with many different parties onsite. RRC provided procurement support, structural and electrical re-design for parts of the 34.5 kV system, construction support, contractor management, and testing and commissioning support.

## **ARROYO SUBSTATION PROJECT**

- Location: Las Cruces, New Mexico

RRC provided the substation grounding analysis and ground design for this essential project. Deliverables included a detailed grounding report, detailed ground plan, grounding details and connections, and a bill of materials. Additional services included updating deliverables after expansion of the substation.



# OFFICE LOCATIONS

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## **Hobbs, New Mexico**

701 S. Cecil Street  
Hobbs, NM 88240  
575.602.2424

## **Round Rock, Texas**

3801 Doris Lane, Suite A  
Round Rock, TX 78664  
512.992.2087

## **Maple Grove, Minnesota**

11282 - 86th Avenue North  
Maple Grove, MN 55369  
612.225.1240

## **Tualatin, Oregon**

7591 SW Mohawk Street  
Tualatin, OR 97062  
503.379.0145

## **Midland, Texas**

3011 South County Road 1260, Suite A  
Midland, TX 79706

## **RRC Power & Energy, LLC**

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